Vol. 1028 Number 4

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of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

March 22, 1983 Volume 1028 Number 4

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1028 OG 32
Reissue Applications Filed	1028 OG 32
Request for Reexamination Filed	1028 OG 32
Patent Certificates of Correction	1028 OG 33
Disclaimers	1028 OG 33
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1028 OG 35
Condition of Patent Applications	1028 OG 36
Reexaminations	1028 OG 37
Reissue Patents Granted (31,183)	673
Plant Patents Granted (5,000)	675
Patents Granted	
General and Mechanical (4,377,007)	677
Chemical (4,377,387)	807
Electrical (4,377,722)	905
Design Patents Granted (268,298)	957
Index of Patentees	PI 1
Indices of Reissue, Reexamination, Design and Plant Patentees	PI 32
Classification of	
Patents (Including Reissues and Reexaminations)	PI 35
Designs and Plants	PI 37
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 38
Designs and Plants	PI 39
Change of Address Form and Subscription Order Form	Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

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THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
• No corresponding prior U.S. national application filed	500.00
• Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
• All cases	670.00
International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

GERALD J. MOSSINGHOFF,
Dec. 3, 1982. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,240,907, Re. S.N. 452,848, Filed Dec. 23, 1982, Cl. 210/646, DIALYZER AND METHOD OF DIALYSIS, Donald J. Bentley, Owner of Record: *Bentley Laboratories, Inc., Irvine, Calif.,* Attorney or Agent: John B. Young, et al., Ex. Gp.: 176

4,296,158, Re. S.N. 446,635, Filed Dec. 3, 1982, Cl. 428/65, INFORMATION CARRYING DISCS, Terry W. Lewis, Owner of Record: *Minnesota Mining and Manufacturing Co., St. Paul, Minn.,* Attorney or Agent: Cruzan Alexander, et al., Ex. Gp.: 164

4,300,192, Re. S.N. 453,311, Filed Dec. 27, 1982, Cl. 364/200, METHOD AND MEANS FOR STORING AND ACCESSING INFORMATION IN A SHARED ACCESS MULTIPROGRAMMED DATA PROCESSING SYSTEM, John F. Couleur, et al., Owner of Record: *Honeywell Information Systems, Inc., Waltham, Mass.,* Attorney or Agent: Lewis P. Elbinger, et al., Ex. Gp.: 237

4,320,838, Re. S.N. 442,880, Filed Nov. 19, 1982, Cl. 206/564, CALCULATOR TRAY APPARATUS, Sanford L. Braver, Owner of Record: *BCG, Ltd., Phoenix, Ariz.,* Attorney or Agent: H. Gordon Shields, Ex. Gp.: 241

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

Des. 244,182, Reexam. No. 90/000,325, Requested: Feb. 7, 1983, Cl. D12/156, CAMPER SHELL, Wilbert L. Skidmore, et al., Owner of Record: *Fiber Glass in Motion, Inc., Norco, Calif.,* Attorney or Agent: Harold L. Jackson, Ex. Gp.: 290, Requester: Albert Hindelang, Chino, Calif.

3,837,501, Reexam. No. 90/000,327, Requested: Feb. 14, 1983, Cl. 210/522, SEPARATION DEVICE, Jacob Pielkenrood, Owner of Record: *Pielkenrood-Vinit Holland,* Attorney or Agent: Ronald G. Bliss, Ex. Gp.: 170, Requester: Pacesetter Separator Co., Corpus Christi, Tex.

3,991,600, Reexam. No. 90/000,331, Requested: Feb. 17, 1983, Cl. 72/203, STIRRUP MACHINE, Remigio Del Fabro, Owner of Record: *Inventor,* Attorney or Agent: Browdy & Neimark, Ex. Gp.: 320, Requester: Ernest F. Marmorek, New York, N.Y.

4,184,134, Reexam. No. 90/000,323, Requested: Feb. 4, 1983, Cl. 335/198, ELECTRICAL SWITCHING APPARATUS HAVING CONVERTIBLE CONTACT STRUCTURE, Hugh Kane, et al., Owner of Record: *GTE Products Corp., Stamford, Conn.,* Attorney or Agent: David M. Keay, Ex. Gp.: 210, Requester: Owner

4,289,791, Reexam. No. 90/000,328, Requested: Feb. 16, 1983, Cl. 426/139, ICE CREAM WITH JACKET ATTACHED AND METHOD FOR PRODUCING SAME, David Weinstein, Owner of Record: *Maryland Cup Corp., Owings Mills, Md.,* Attorney or Agent: Birch, Stewart, et al., Ex. Gp.: 170, Requester: Owner

4,305,033, Reexam. No. 90/000,326, Requested: Feb. 10, 1983, Cl. 323/306, POLYPHASE FERRORESONANT VOLTAGE STABILIZER HAVING INPUT CHOKES WITH NON-LINEAR IMPEDANCE CHARACTERISTIC, Jeffrey M. Powell, Owner of Record: *Liebert Corp., Columbus, Ohio,* Attorney or Agent: Mueller & Smith, Ex. Gp.: 212, Requester: Lortec Power Systems, Inc., North Ridgeville, Ohio

4,323,312, Reexam. No. 90/000,329, Requested: Feb. 15, 1983, Cl. 366/102, FLUIDIZED BED APPARATUS, Werner Glatt, Owner of Record: *Inventor,* Attorney or Agent: Karl W. Flocks, Ex. Gp.: 242, Requester: Freund Industrial Co., Ltd., Tokyo, Japan

4,344,132, Reexam. No. 90/000,332, Requested: Feb. 18, 1983, Cl. 364/200, SERIAL STORAGE INTERFACE APPARATUS FOR COUPLING A SERIAL STORAGE MECHANISM TO A DATA PROCESSOR INPUT/OUTPUT BUS, Jerry D. Dixon, et al., Owner of Record: *International Business Machines Corp., Armonk, N.Y.,* Attorney or Agent: Richard E. Bee, Ex. Gp.: 237, Requester: IBM Corp., Boca Raton, Fla.

PATENT NOTICES

Certificates of Correction for the Week of Mar. 22, 1983

Re. 31,048	4,347,230	4,359,082	4,364,911
D. 264,660	4,347,425	4,359,233	4,365,324
D. 267,411	4,347,444	4,359,456	4,365,429
D. 267,444	4,347,565	4,359,662	4,365,584
3,792,529	4,347,568	4,360,040	4,365,659
3,923,918	4,348,226	4,360,078	4,365,691
4,016,118	4,348,532	4,360,712	4,365,849
4,035,929	4,348,996	4,361,066	4,365,857
4,158,707	4,350,079	4,361,350	4,365,932
4,161,968	4,351,136	4,361,537	4,366,013
4,246,567	4,351,941	4,361,903	4,366,077
4,256,898	4,352,053	4,362,198	4,366,198
4,283,332	4,354,179	4,362,366	4,366,393
4,291,146	4,355,431	4,362,449	4,366,499
4,293,489	4,355,446	4,362,733	4,366,560
4,301,161	4,355,467	4,362,838	4,366,710
4,308,207	4,355,489	4,362,907	4,366,729
4,308,898	4,355,642	4,363,077	4,367,092
4,315,080	4,355,828	4,363,172	4,367,105
4,326,997	4,356,346	4,363,291	4,367,106
4,328,224	4,356,879	4,363,317	4,367,148
4,328,231	4,356,888	4,363,335	4,367,259
4,330,403	4,356,986	4,363,388	4,367,601
4,330,613	4,357,277	4,363,468	4,367,688
4,332,206	4,357,493	4,363,534	4,368,243
4,336,196	4,357,520	4,363,543	4,368,425
4,336,662	4,357,534	4,363,613	4,368,684
4,336,984	4,357,599	4,363,748	4,369,332
4,338,307	4,358,026	4,363,828	4,369,590
4,342,307	4,358,412	4,363,973	4,370,197
4,342,331	4,358,627	4,364,177	4,371,949
4,343,147	4,358,752	4,364,197	
4,345,771	4,359,062	4,364,744	

Disclaimers

3,244,524.—*Donald E. Trucker,* Binghamton, N.Y. U. V. ABSORBING COMPOSITION. Patent dated Apr. 5, 1966. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

3,291,607.—*Fritz Dersch,* Binghamton, *Betty D. Fadden,* Johnson City, and *William L. Wike,* Endicott, N.Y. WATER-SOLUBLE POLYOXYALKYLENATED BUTYNE-2-DIOL-1,4 DEVELOPMENT ACCELERATORS. Patent dated Dec. 13, 1966. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

3,352,675.—*Edward Cerwonka,* Binghamton, N.Y. PHOTOPOLYMERIZATION OF VINYL MONOMERS BY MEANS OF FERRIC SALTS OF ORGANIC ACIDS. Patent dated Nov. 14, 1967. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

3,359,104.—*Felix Viro,* Apalachin, N.Y. COLOR DIFFUSION TRANSFER PROCESS AND NEGATIVE MATERIAL THEREOF. Patent dated Dec. 19, 1967. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

3,436,215.—*Steven Levinos* and *Albert S. Deutsch,* Vestal, N.Y. PHOTOPOLYMERIZATION INITIATED BY ELECTROLYSIS OF A CATALYST PROGENITOR EXPOSED THROUGH A PHOTOCONDUCTIVE LAYER. Patent dated Apr. 1, 1969. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

3,480,786.—*Joseph J. Kottman,* Binghamton, N.Y. FLAW DETECTING SYSTEM INCLUDING SYNCHRONOUSLY ROTATING OPTIC FIBER TUBES. Patent dated Nov. 25, 1969. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

3,486,890.—*Dewey M. Dumers,* Binghamton, N.Y. COLOR OSCILLOGRAPH RECORDING PAPER CONTAINING A COLOR DEVELOPING AGENT. Patent dated Dec. 30, 1969. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

3,499,758.—*Carl E. Johnson* and *Dewey M. Dumers,* Binghamton, N.Y. COLOR OSCILLOGRAPH RECORDING PAPER. Patent dated Mar. 10, 1970. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

3,512,970.—*Frederick W. Millard,* Montrose, Pa. PHOTOPOLYMERIZATION. Patent dated May 19, 1970. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

3,594,243.—*Albert S. Deutsch,* Vestal and *William G. Herrick,* Binghamton, N.Y. FORMATION OF POLYMERIC RESISTS. Patent dated July 20, 1971. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

3,597,202.—*Edward Cerwonka,* Binghamton, N.Y. PHOTO POLYMERIZATION PROCESS. Patent dated Aug. 3, 1971. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

3,600,173.—*Steven Levinos,* Vestal, N.Y. PHOTOELECTROPOLYMERIZATION. Patent dated Aug. 17, 1971. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

3,606,662.—*James E. Hoover,* Binghamton, N.Y. FILM WINDING AND STAKING APPARATUS. Patent dated Sept. 21, 1971. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

3,620,734.—*Edward J. Cerwonka,* Binghamton, N.Y. POSITIVE-WORKING PHOTOPOLYMERIZATION PROCESS. Patent dated Nov. 16, 1971. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

3,748,715.—*James E. Hoover,* Binghamton, *Robert W. Houser,* Vestal, and *Bernard C. Sheffer,* Binghamton, N.Y. AUTOMATIC ASSEMBLY MACHINE FOR FILM CARTRIDGES. Patent dated July 31, 1973. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

3,982,258.—*Walter N. Czebiniak,* Sunnyvale, Calif. PHOTOGRAPHIC PLATE DEVELOPER APPARATUS. Patent dated Sept. 21, 1976. Disclaimer filed Sept. 30, 1982, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to all claims of said patent.

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*Collection organized by subject matter.

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF February 19, 1983

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-16-81
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	11-20-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	7-14-81
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	1-20-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	11-12-81
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	4-7-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-12-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	11-24-80
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	1-07-81
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-80
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	1-13-81
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-18-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	5-18-81
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	2-13-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-17-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	9-12-80

Expiration of patents: The patents within the range of numbers indicated below expire during February 1983, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,231,896 to 3,237,200, inclusive

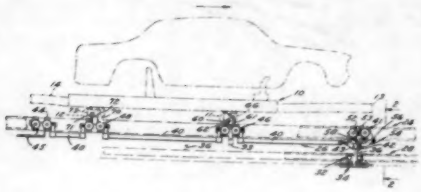
Plant Patents ..... Numbers 2,591 to 2,605 inclusive

REEXAMINATIONS

MARCH 22, 1983

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination

B1 3,518,946 (62nd)
PUSHER CONVEYOR FOR WHEELED CARRIERS
Sheldon M. Kavieff, Farmington, Mich., assignor to Jervis B. Webb Company, Farmington, Hill, Mich.
Reexamination Request No. 90/000,059, Aug. 21, 1981.
Reexamination Certificate for Patent No. 3,518,946, issued Jul 7, 1970, Ser. No. 700,086, Jan 24, 1968.
U.S Cl. 104/172 B **Int. Cl.³ B61B 13/00**



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **3–8**, **14** and **15**, having been finally determined to be unpatentable are cancelled.

Claims **2**, **9** and **11** are determined to be patentable as amended;

Claims **10**, **12** and **13**, dependent on amended claims, are determined to be patentable.

New claims **16–21** are added and determined to be patentable.

16. A conveyor comprising:

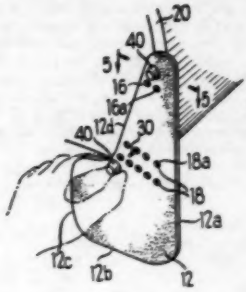
a carrier and a support on which the carrier is adapted to travel;

a pusher conveyor including a track mounted in spaced relation to the carrier support, a propelling member with pushers thereon movably carried by said track, and means for driving the propelling member;

a tow trolley unit, track structure supporting the tow trolley unit for travel adjacent to the pusher conveyor track and the carrier support, the track structure supporting the tow trolley unit being mounted above the pusher conveyor track and intermediate said track and the carrier support, the tow trolley unit having a releasable driving dog engageable by a pusher of the pusher conveyor propelling member, means mounting the releasable driving dog on the tow trolley unit for vertical movement between a lower driving position and an upper non-driving position relative to a pusher of the pusher conveyor;

driving dog releasing means carried by the tow trolley unit for moving the releasable driving dog to nondriving position in response to engagement between said releasing means and an object in the path of travel of said tow trolley unit; and, means for transmitting motion of the tow trolley unit to the carrier to propel the carrier along the support.

B1 4,264,083 (63rd)
SPLASH GUARD
Kenneth S. Mathew, Northbrook, Harry J. Dickey, Bellwood, both of Ill., assignors to Custom Accessories, Inc., Lincolnwood, Ill.
Reexamination Request No. 90/000,164, Feb. 19, 1982.
Reexamination Certificate for Patent No. 4,264,083, issued Apr. 28, 1981, Ser. No. 68,729, Aug. 22, 1979.
U.S. Cl. 280/154.5 R **Int. Cl.³ B62B 9/14.**



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **21–23** having been finally determined to be unpatentable, are cancelled.

Claims **1–20** are determined to be patentable as amended:

1. A splash guard or mud flap *assembly* for attachment to the fender of a *motor* vehicle, comprising: a flexible, splash-intercepting body portion [,]*; resilient, self-sustaining* anchoring means for supporting the body portion and being adapted to be *snugly* engaged along the fender of a *motor* vehicle for [positioning] *securing* the body portion *in a splash-intercepting position* thereon, said anchoring means including a front wall and a back wall resiliently integrally joined along one side in substantial overlying relation to one another *and converging in the direction of the free ends thereof,* the free ends of said walls being *resiliently* separable a distance to enable the anchoring means to be snugly frictionally engaged on a *motor* vehicle fender, the resiliency of the anchoring means being such that the front wall and the back wall thereof provide substantially the total gripping force for maintaining the anchoring means on a *motor* vehicle fender while providing a rigid support base for the splash-intercepting body portion of the splash guard, and an outwardly extending pin-like member carried on the front wall of the resilient anchoring means *in spaced, inward relation to the free ends of said walls of the anchoring means* for engaging and retaining said body portion on the anchoring means, said pin-like member being provided with *locking* means for securing and maintaining the *splash-intercepting* body portion on the anchoring means*, said locking means being characterized in that it overlies and is in contact with a sufficient area of the splash-intercepting body portion to resist any forces tending to dislodge said body portion from the pin-like member.*

B1 3,950,850 (64th)

DENTAL PROSTHETIC IMPLANTS

Thomas D. Driskell; Alfred L. Helier, both of Worthington; Joseph F. Koenigs, Columbus, all of Ohio, assignors to Miter, Inc., Worthington, Ohio

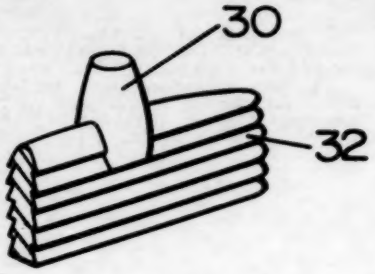
Reexamination Request No 90/000,129, Dec. 21, 1981.
Reexamination Certificate for Patent No. 3,950,850, issued Apr. 20, 1976, Ser. No. 445,567, Feb. 25, 1974.
US. Cl. 433/176 **Int. Cl.[3] A61C 8/00**

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 1 is determined to be patentable as amended:

1. A dental, prosthetic, endostial implant comprising:

a. a base formed of relatively high purity, high density, low porosity alumina, said base in an implanted operable position having opposite ends and having side walls integrally formed with *continuous* outwardly projecting protrusions which include *alternating* substantially flat horizontal surface areas facing in the direction of the implanted end *and downwardly and outwardly tapering oblique surface areas connecting therebetween for the purpose of optimizing the stress-bearing area of the bone-to-implant interface* [, said surface areas being produced by a series of steps having undersurfaces whereby a significant area facing toward the implanted end is produced] to *effectively* transfer the axial *and lateral* loading over a greater area; and



b. a post extending generally vertically from the other end of said base and contoured in a generally rounded, horizontal cross section configuration for attachment of at least one prosthetic crown.

REISSUES

MARCH 22, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,183

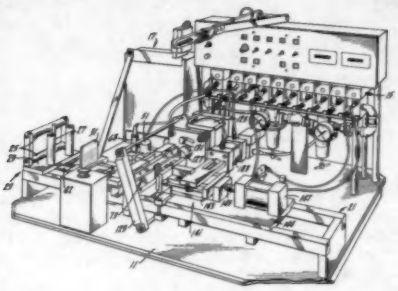
TERMINAL FORMING AND INSTALLING APPARATUS

Maurice H. Brown, 11700 S. Mayfield, Worth, Ill. 60482

Original No. 4,206,861, dated Jun. 10, 1980, Ser. No. 13,327, Feb. 21, 1979. Continuation-in-part of Ser. No. 844,034, Oct. 20, 1977, abandoned, which is a division of Ser. No. 738,639, Nov. 3, 1976, Pat. No. 4,068,367. Application for reissue Nov. 4, 1981, Ser. No. 318,103

Int. Cl.³ B65H *17/26*

U.S. Cl. 226—134 **6 Claims**



3. An apparatus for releasably clamping a plurality of lengths of wire, said apparatus including:

[a wire guide, at least one wire receiving slot formed in said wire guide,]

a pair of spaced rods,

a plurality of plates [located] *mounted on said rods* adjacent one another in a stack and having flat surfaces which normally contact one another,

[said stack of plates being located adjacent said wire guide with the wire receiving slot extending at right angles to the flat surfaces of said plates,]

a plurality of wires extending through said stack with at least one wire extending between at least one pair of plates to hold the pair of plates apart when the wires extend through said stack,

said lengths of wire movable between said plates when the plates are loosely positioned in the stack of plates [with said wire guide preventing movement of the wires laterally of the plates],

means to guide the wires to prevent movement of the wires laterally of the plates, and

means to releasably clamp the stack of plates to force the flat plates [against any wires between them and] against one another when no wires are located between them *and against any wires positioned between the plates* to prevent the wires from moving through the stack.

Re. 31,184

RESILIENT MOUNT FOR MACPHERSON STRUT

Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Original No. 4,274,655, dated Jun. 23, 1981, Ser. No. 88,838, Oct. 29, 1979. Application for reissue Sep. 14, 1981, Ser. No. 302,221

Int. Cl.³ B60G *11/42*

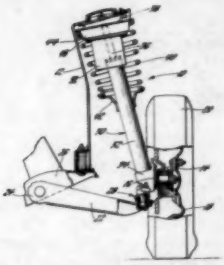
U.S. Cl. 280—668 **14 Claims**

5. A resilient mount for the upper end of a vehicle suspension strut comprising a shock absorber having an outer casing and a piston rod extending out of its upper end, and a coil spring surrounding the shock absorber and supported at its lower end by a spring plate attached to the outer casing, comprising:

an annular mounting plate for securing the resilient mount to vehicle support structure bonded to an upper surface of an elastomeric ring for cushioning the loads of the coil spring as well as the loads of the shock absorber during suspension jounce and rebound,

an upper race ring bonded to a lower surface of the elastomeric ring and spaced from a cup-shaped central portion of the annular mounting plate embedded in the elastomeric ring,

thrust bearing means for rotatably supporting the upper end of the coil spring comprising the upper race ring bonded to the



elastomeric ring, a complement of bearing elements and a lower race ring,

said elastomeric ring having integral flexible lips at the lower end which engage the lower race ring so that the inner and outer ends of the thrust bearing means are sealed and at least one said lip retains the lower race ring in assembly with the elastomeric ring, and

a central sleeve secured to the elastomeric ring for attaching the end of the piston rod of the shock absorber having an enlarged head disposed inside of the cup-shaped central portion of the annular mounting plate with a portion of the elastomeric ring disposed therebetween.

Re. 31,185

PROCESS AND APPARATUS FOR DEHYDRATING WASTE SOLIDS CONCENTRATES

Charles Greenfield, Murray Hill, and Anthony J. Bonanno, Parsippany, both of N.J., assignors to Hanover Research Corporation, East Hanover, N.J.

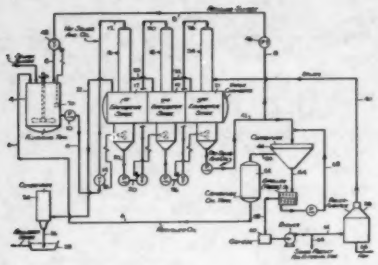
Original No. 4,276,115, dated Jun. 30, 1981, Ser. No. 96,391, Nov. 21, 1979. Application for reissue Mar. 9, 1982, Ser. No. 356,346

Int. Cl.³ B01D *1/26*

U.S. Cl. 159—1 RW **15 Claims**

1. In a process for dehydrating initially water-containing waste solids concentrates chosen from the group consisting of secondary sewage sludge, digested sewage sludge, mixtures of primary and secondary sewage sludges, those having relatively high quantities of iron-fatty acid soaps, those derived from packing industry wastes, and those containing animal manure, said concentrates having a non-fat solids concentration in the range 10% to 35% by weight on an oil-free basis, that process comprising the steps of (1) admixing such a waste solids concentrates with [a relatively non-volatile] *an* oil to obtain a mixture which will remain fluid and pumpable after the removal of its water content by heat evaporation; (2) dehydrating the resultant oil-containing mixture by heat evaporation in

a multi-stage evaporator in a sequence of steps so ordered that the vapors evolved from each such step except the first are used as a heating medium in the preceding step, and (3) withdrawing a substantially anhydrous waste solids and oil slurry from a late stage of said evaporator, the improvement which



comprises recycling at least a portion of the slurry so withdrawn and admixing it with the waste solids concentrate and oil in step (1) to form a mixture constituting a steady state feed material to said multi-stage evaporator having a non-fat solids content of from 25% to 60% on an oil-free basis.

Re. 31,186

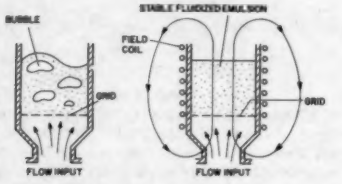
HYDROCARBON CONVERSION PROCESS UTILIZING A MAGNETIC FIELD IN A FLUIDIZED BED OF CATALYTIC PARTICLES

Ronald E. Rosensweig, Summit, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Original No. 4,136,016, dated Jan. 23, 1979, Ser. No. 866,780, Jan. 3, 1978. Division of Ser. No. 786,613, Apr. 11, 1977, Pat. No. 4,115,927, which is a continuation-in-part of Ser. No. 610,071, Sep. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 514,003, Oct. 11, 1974, abandoned. Application for reissue Dec. 30, 1980, Ser. No. 221,372

Int. Cl.³ C10G *23/10, 35/14*

U.S. Cl. 208—134 **20 Claims**



7. A process for carrying out a hydrocarbon conversion of a fluid stream of a hydrocarbon feedstock in a fluidized bed, which process comprises:

(a) carrying out said hydrocarbon conversion process under hydrocarbon conversion conditions, passing said stream through at least one controllably transported hydrocarbon conversion fluidized bed containing magnetizable composite particles which contain 2 to 40 volume % ferro- or ferrimagnetic material, said bed of particles being expanded and levitated by said stream, and

(b) controllably transporting said bed in response to a pressure differential in said bed, wherein at least a portion of said bed is subjected to an applied magnetic field having a substantial component along the direction of the external force field within said bed at a strength such that gross solids backmixing and fluid by-passing in said bed are suppressed but less than that which impairs the fluid-like properties of the bed.

Re. 31,187

CATALYST SYSTEM

Nikolsous K. Baliat, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Original No. 4,207,206, dated Jun. 10, 1980, Ser. No. 947,086, Sep. 29, 1978. Application for reissue Jun. 8, 1981, Ser. No. 271,564

Int. Cl.³ C08F *4/64*

U.S. Cl. 252—429 B **27 Claims**

1. A catalyst composition for the polymerization of propylene or mixtures of propylene and copolymerizable alpha-olefins, which produces low amounts of n-hexane-soluble polymer, comprising a titanium trihalide; an organoaluminum compound selected from the group consisting of dialkyl aluminum halide, trialkyl aluminum, a mixture thereof, and a mixture of trialkyl aluminum with alkyl aluminum dihalide; and a [Group Va] *nitrogen* or Group VII oxygen mineral acid in a molar ratio to titanium trihalide from about 0.005 to 1 to about 0.7 to 1.

Re. 31,188

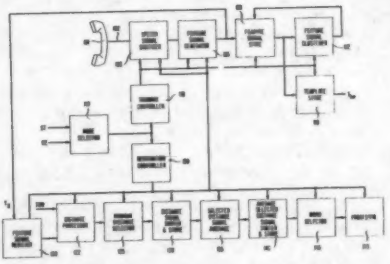
MULTIPLE TEMPLATE SPEECH RECOGNITION SYSTEM

Frank C. Pirz, Madison Township, Morris County, and Lawrence R. Rabiner, Berkley Heights, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Original No. 4,181,821, dated Jan. 1, 1980, Ser. No. 956,438, Oct. 31, 1978. Application for reissue Dec. 31, 1981, Ser. No. 336,067

Int. Cl.³ G10L *1/00*

U.S. Cl. 179—1 SD **26 Claims**



1. A circuit for recognizing an unknown utterance as one of a set of reference words comprising means responsive to each of a plurality of utterances of a reference word for generating a set of signals representative of the features of said utterance; means responsive to the feature signal sets of each reference word for generating at least one temple signal, each template signal being representative of a group of said reference word feature signal sets; means responsive to the unknown utterance for generating a set of signals representative of the features of said unknown utterance; means jointly responsive to said unknown utterance feature signal set and each reference word template signal for forming a set of signals each representative of the similarity between said unknown utterance feature signal set and said reference word template signal; characterized in that selection means (130) are responsive to the similarlity signals for each reference word to select a plurality of said reference word similarity signals; averaging means (135) are adapted to form a signal corresponding to the average of said selected similarity signals for each reference word; and identifying apparatus (140, 145) is responsive to the average similarity signals for said reference words to identify said unknown utterance as the most similar reference word.

PLANT PATENTS

GRANTED MARCH 22, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,000

ROSE PLANT—74-2179-18

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Sep. 8, 1981, Ser. No. 299,959
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—20 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its hybrid tea plant habit with non-fragrant blooms with photosensitive pigment changing from pink to red upon exposure to sunlight.

5,001

ROSE PLANT—74-2681

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Sep. 3, 1981, Ser. No. 299,024
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—24 1 Claim

1. A new and distinct variety of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its compact plant, glossy, disease resistant foliage, yellow blooms, light fragrance and numerous, large prickles.

5,002

ROSE PLANT 75-21023—JACUM

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Sep. 8, 1981, Ser. No. 299,980
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—27 1 Claim

1. A new and distinct variety of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its novel purple color, strong fragrance, floribunda habit and mildew resistant foliage.

5,003

FLOWERING PLUM TREE

J. Frank Schmidt, III, 14131 SE. 312th, Boring, Oreg. 97009

Filed Jun. 22, 1981, Ser. No. 275,716
Int. Cl.³ A01H 5/12
U.S. Cl. Plt.—37 1 Claim

1. A new and distinct variety of flowering plum tree substantially herein shown and described, characterized particularly as to novelty by its vigorous rate of growth and large foliage.

5,004

FEMALE HOLLY PLANT

Lester L. Demaline, Avon, Ohio, assignor to Willoway Nurseries, Inc., Avon, Ohio

Filed May 13, 1981, Ser. No. 263,214
Int. Cl.³ A01H 5/12
U.S. Cl. Plt.—65 1 Claim

1. A new and distinct variety of female holly plant, Ilex, substantially as shown and described herein.

5,005

LILY PLANT: LILIUM HARVEST

Edward A. McRae, Boring, Oreg., assignor to Melridge, Inc., Sandy, Oreg.

Filed Oct. 27, 1980, Ser. No. 200,967
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—68 1 Claim

1. A new and distinctive variety of Asiatic hybrid lily plant substantially as herein shown and described, characterized by its rapid natural propagation under field conditions, vigorous and healthy growth when forced under glass, and a uniform growth to maturity when forced to flower throughout the year; by its exceptionally large bud size and bright orange bud color; by its broad and thick petaled flowers; and by the intense bright orange color of its flowers.

5,006

LILY PLANT: LILIUM INFERNO

Edward A. McRae, Boring, Oreg., assignor to Melridge, Inc., Sandy, Oreg.

Filed Oct. 27, 1980, Ser. No. 200,968
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—68 1 Claim

1. A new and distinctive variety of Asiatic hybrid lily plant substantially as herein shown and described characterized by its rapid natural propagation under field conditions, its vigorous and healthy growth when forced under glass, its unusually rapid growth to its flowering stage when forced under glass, its resistance to disease and virus, and the brilliant orange color of its flowers, with virtually no spots.

5,007

LILY PLANT: LILIUM 'PICASSO'

Edward A. McRae, Boring, Oreg., assignor to Melridge, Inc., Sandy, Oreg.

Filed Oct. 27, 1980, Ser. No. 200,969
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—68 1 Claim

1. A new and distinctive variety of Asiatic hybrid lily plant substantially as shown and described, characterized by its rapid natural propagation under field conditions, by its vigorous and healthy growth when forced under glass, by the brilliant orange color of its buds, and by its brilliant orange flowers, unspotted but characterized by the presence of distinctive oxblood red "brush marks".

5,008

LILY PLANT (LILIUM GOLDRUSH)

Edward A. McRae, Boring, Oreg., assignor to Melridge, Inc., Sandy, Oreg.

Filed Apr. 29, 1981, Ser. No. 258,744
Claims priority, application Netherlands, Mar. 19, 1980, LEL 97
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—68 1 Claim

1. A new and distinctive variety of Asiatic hybrid lily plant substantially as herein shown and described, characterized by its rapid natural propagation under field conditions, vigorous and healthy growth when forced under glass, and uniform growth to maturity when forced to flower throughout the year; by its early attainment of marketable bulb size and bulb maturity; relatively short foliage; foliage resistant to scorching when forced into flower under glass during the winter; buds of a clear, medium yellow color; and virtually unspotted flowers of bright, deep yellow color having tepals of increased breadth and width.

5,009

CHRYSANTHEMUM NAMED SNOW WESTLAND

Jacques C. M. van der Knaap, De Lier, Netherlands, assignor to Pan-American Plant Company, Parrish, Fla.

Filed Oct. 2, 1980, Ser. No. 193,032
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—76 1 Claim

1. A new and distinct chrysanthemum cultivar, substantially as herein shown and described, characterized by its white spoon-tipped ray florets radiating from inner florets of a very light yellow color.

5,010

CHRYSANTHEMUM PLANT

Earl T. May, 2021 Sheridan Rd., Encinitas, Calif. 92024

Filed Sep. 21, 1981, Ser. No. 303,865
Int. Cl.³ A01H 5/00
U.S. Cl. Plt.—80 1 Claim

1. A new and distinctive cultivar of chrysanthemum plant, substantially as herein described, and distinguished from its parent by a darker flower color, an earlier display of bud color and an overall flower response which is 3–4 days later, and a more coarse flower form due to lateral petal roll and/or rudimentary appendages — notched petal tips.

PATENTS

GRANTED MAR. 22, 1983

ERRATA

For CLASS	See PATENT NO.
604–008	4,377,169
494–038	4,377,253
494–012	4,377,254
420–578	4,377,411
015–236	4,377,412
548–461	4,377,525
377–002	4,377,740
378–110	4,377,748
378–152	4,377,752
382–009	4,377,803

PATENTS

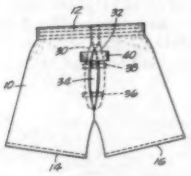
GRANTED MARCH 22, 1983

GENERAL AND MECHANICAL

4,377,007
CONVERTIBLE LENGTH GARMENT
Mary Sudjian, Elkins Park, Pa., assignor to Nannette Manufacturing Company, Inc., Philadelphia, Pa.
Filed Aug. 10, 1981, Ser. No. 291,464
Int. Cl.³ A41D *1/22, 17/02*
U.S. Cl. 2—105 **9 Claims**

1. A convertible length garment comprising an overdress capable of being worn alone and having a first skirt portion, and a complimental underdress adapted to be worn beneath the overdress, said underdress having a second skirt portion extending, when said overdress and underdress are worn together, beyond the hemline of said first skirt portion, whereby said second skirt portion provides an extension of said first skirt portion.

4,377,008
ARTICLE OF CLOTHING
Jung D. Jung, Glendale, Calif., assignor to Chicksu Thomas Yi, Rolling Hills and Helen Yuki Jung, Glendale, both of, Calif.
Filed Jun. 26, 1980, Ser. No. 163,388
Int. Cl.³ A41B *9/02*
U.S. Cl. 2—403 **7 Claims**



1. In a male undergarment to be worn over the lower torso, said undergarment having a base opening in the front thereof for access to the genitalia, an improvement in said undergarment, said improvement comprising, in combination:

(a) Scrotum-retaining means for separating the scrotum of the wearer of the undergarment from direct contact with other parts of the wearer's body;

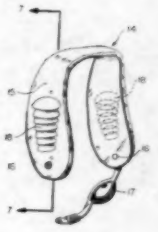
(b) penis-retaining means associated with said scrotum-retaining means for separating the penis of the wearer of the undergarment from direct contact with the scrotum, whereby the scrotum is kept at a reduced temperature for enhancement of hormone and sperm production, said scrotum-retaining means comprising:

(c) An outer-cover member attached to the undergarment and covering the front base opening of the undergarment for providing a separate scrotum-retaining compartment between said outer-cover member and the front of said undergarment for separating the scrotum from direct contact with other parts of the wearer's body; and

(d) means for biasing the base opening in the front of the undergarment toward it's closed position next to the base of the scrotum which passes through said opening while the undergarment is being worn, to retain the scrotum within said separate compartment, and

(e) means for biasing the base front opening of the undergarment toward it's closed position adjacent to the base of the penis which passes through said opening, while the undergarment is being worn, to aid in retaining the penis in the upper portion of said scrotum-retaining compartment.

4,377,009
HEAD PROTECTOR
Huey Douglas, 1024 Flora La., Baton Rouge, La. 70810
Division of Ser. No. 76,074, Sep. 17, 1979, Pat. No. 4,322,858. This application Dec. 17, 1981, Ser. No. 331,591
Int. Cl.³ A42B *1/08*
U.S. Cl. 2—411 **4 Claims**



1. A jaw protective garment to be worn by a person to protect the jaw bones of said person comprising:

(a) a soft, flexible head piece shaped to fit over the top of the head of said person and extending down each side of said head a sufficient distance to cover the back portion of the said jaw bones;

(b) a chin strap attached to said head piece and shaped to fit snugly against the chin of said person to hold said piece in position; and

(c) flap assemblies having overlapping, flexible convex flaps attached to said head piece and shaped to cover said back portion of said jaw bones for absorbing a blow thereto.

4,377,010
BIOCOMPATIBLE MATERIAL COMPRISING A BASE POLYMER BULK GRAFT POLYMERIZED WITH AN ETHYLENICALLY UNSATURATED CARBOXYLIC ACID
Peter J. Fydelor, Swindon, and David E. M. Taylor, Hounslow, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England
Filed Oct. 31, 1979, Ser. No. 90,084
Claims priority, application United Kingdom, Nov. 8, 1978, 43624/78
Int. Cl.³ A61F *1/22, 1/24*
U.S. Cl. 3—1.4 **15 Claims**

1. A biocompatible surgical device comprising a hydrophilic thermoplastic graft copolymer

which is a base polymer, selected from the group consisting of polyolefins, partially or fully fluorinated polyolefins, polyetherurethanes, polydimethyl siloxanes, polyethylene glycol terephthalates, polyamides, polyacrylonitriles, polyvinyl chlorides, polyvinylidene chlorides, polyvinyl

pyrrolidones and copolymers of the monomers of two or more of said polymers,

graft copolymerized with an ethylenic carboxylic acid by subjecting the base polymer to ionizing radiation in the presence of a monomeric ethylenic carboxylic acid, said surgical device adapted to be implanted into the living mammalian body or applied to the outer surface of the living mammalian body or to function as a body fluid contacting surface in an extra corporeal body fluid treating device.

12. A biocompatible surgical device according to claim 1 in the form of a vascular prosthesis.

13. A biocompatible surgical device according to claim 1 in the form of a temporary covering for skin loss or open wounds.

14. A biocompatible surgical device according to claim 1 in the form of a body fluid contacting surface for use in an extra corporeal, body fluid treating device.

4,377,011

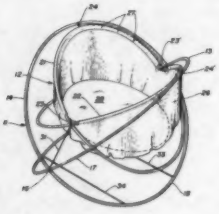
INFANT CRADLE

James Kinberger, P.O. Box 394, Stinson Beach, Calif. 94970

Filed Jan. 2, 1981, Ser. No. 222,173

Int. Cl.³ A47D *9/00*

U.S. Cl. 5—102 **7 Claims**



1. A cradle for a child comprising:

an outer frame comprising two hoops connected at a first pair of pivots to pivot between an open position and a collapsed position, and rockers positioned on said hoops beneath said first pair of pivots when said outer frame is in said open position;

an inner frame comprising two U-shaped portions connected at second pair of pivots to pivot between an open position and a collapsed position;

a third pair of pivots proximate the apexes of said U-shaped portions and connecting said U-shaped portions to opposite upper portions of said hoops equidistant from said first pair of pivots and equidistant from said second pair of pivots whereby said first pair and said second pair of pivots lie in a plane;

a collapsible receptacle, supported by said inner frame and oriented with its longitudinal axis parallel to the line joining said third pair of pivots when said outer frame as in said open position; and

means for damping relative motion of said inner and outer frames in the plane perpendicular to theline joining said third pair of pivots.

4,377,012

SOLE PRESS PAD BOX

John M. Nardone, Wakefield, Mass., assignor to Bush Universal, Inc., Woburn, Mass.

Filed Aug. 12, 1981, Ser. No. 292,269

Int. Cl.³ A43D *63/00*

U.S. Cl. 12—16.4 **9 Claims**

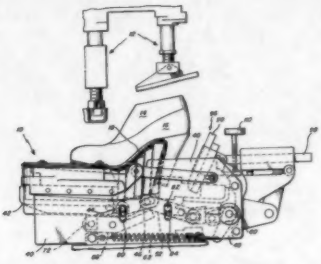
1. A pad box for applying pressure to the bottom of a shoe assembly comprising:

a pad box frame including side walls and means generally defining a bottom wall, the pad box being receptive to pad elements;

the bottom wall including a plurality of articulated members including a forepart tray for supporting a forepart pad and a rearwardly extending link pivotally connected to the forepart tray;

means for supporting each of the forepart trays and the rear end of the first link on rockable pivot whereby the vertical position of the pivotal connection may be varied, thereby varying the angle between the forepart tray and the first link;

means for guiding the pivotal connection between the forepart tray and first link for movement in a generally heightwise direction;



the first link being adapted to receive a plurality of individual, vertically-shiftable shank pads, the upper ends of which may define generally a surface of a contour engageable with a shank region of a shoe assembly;

the pad box including heel supporting means adapted to provide support for pressing force applied to the heel portion of the shoe, the heel supporting means being constructed and arranged to permit a shoe assembly to advance, downwardly into engagement with shank pad elements on the first link, but without transmitting any force to the forepart tray or the first link.

4,377,013

ROTATABLE HAIR BRUSH

Jay E. Tuller, 6377 Chevy Chase #12-122, Houston, Tex. 77057

Filed Nov. 23, 1981, Ser. No. 324,056

Int. Cl.³ A46B *13/08*

U.S. Cl. 15—25 **6 Claims**

1. A rotary implement comprising:

first handle means;

a rod having first and second ends, said rod being rotatably and slidably mounted to said handle means, said rod being slidably displaceable between first and second positions;

an implement head mounted to said first end of said rod means;

a second movable handle means pivotally mounted to said first handle means;

rack means disposed on said second handle means;

a pinion gear rotatably mounted about said second end of said rod means for rotation by said rack means;

at least a portion of said pinion gear having external toothing for engagement with said rack means for rotation therewith;

said pinion gear including first and second oppositely disposed ratchet means, said first ratchet means locking said gear to said rod when said gear is rotated in a first direction, said first ratchet means disengaging said gear from said rod when said gear is rotated in a second direction, said second ratchet means locking said gear to said rod when said gear is rotated in a second direction, said second ratchet means disengaging said gear from said rod when said gear is rotated in said first direction;

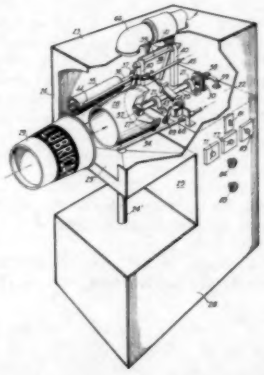
means disposed internally within said gear for the alternate engagement of one of said first and said second ratchet means, said means including splines disposed on said rod and teeth disposed on said first and second ratchet means, said splines engaging said first ratchet means when said rod is in said first position, said splines engaging said second ratchet means when said rod means is in said second position to thereby permit the rotation of said head upon the operation of said moveable handle dependent upon whether said first or said second ratchet means is engaged.

4,377,014

PAIL WASHING MACHINE

Hugh M. Slaton, Rte. 1, Box 193, Hogansville, Ga. 30230

Filed Mar. 9, 1981, Ser. No. 241,842
Int. Cl.³ A46B *13/02*
U.S. Cl. 15—56 **19 Claims**



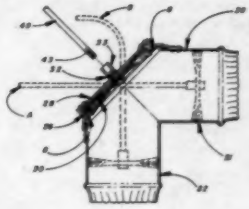
1. A pail washing machine comprising a frame means on said frame for supporting a pail, said pail supporting means including a mandrel having a port for air under vacuum and air under positive pressure, vacuum means connected with said mandrel port and a compressed air supply means also connected with said mandrel port whereby pails may be vacuum secured to said mandrel during said pail washing cycle and ejected therefrom by positive air pressure, means for scrubbing the exterior surface of said pail mounted on said frame for movement toward and away from a pail scrubbing position, means on said frame for delivering cleaning solvent onto said exterior surface of said pail when said pail scrubbing means is in said pail scrubbing position, and timing means electrically connected to said solvent delivering means and said pail scrubbing means for automatically operating said machine during a pail washing cycle, whereby during said cycle, solvent is directed onto the exterior surface of the pail by said solvent delivering means and said scrubbing means is moved to said pail scrubbing position wherein said scrubbing means frictionally engages the exterior surface of said pail to wash said pail.

4,377,015

STOVE PIPE CLEANING APPARATUS

John E. Baugh, 5500 Pierce Park La., Boise, Id. 83703

Filed Feb. 17, 1981, Ser. No. 234,854
Int. Cl.³ A46B *15/00, 17/00*
U.S. Cl. 15—162 **5 Claims**



1. Stove pipe cleanout apparatus comprising:

a stove pipe elbow having an opening upon its greatest curvature, the opening adapted for passage of a brush therethrough and surrounded by a raised sleeve adapted to receive and hold brush means for storage; a lid hingeably engaging the elbow and operable to engage the outer surface of said sleeve for closure of the opening, said lid including a longitudinal slot alignable with tubular projections of said elbow, the slot adapted to receive a brush handle and said lid further including slot closure means pivotally engaging said lid;

brush means insertable through the opening of said elbow; and

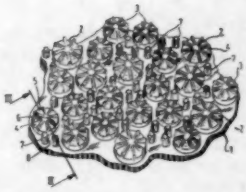
handle means operable to removeably engage said brush through said slot for the cleaning of stove pipes.

4,377,016

FOOTMAT

Anton G. A. Niermeijer, Arnhem, Netherlands, assignor to Vredestein N.V., Velp, Netherlands

Filed Sep. 17, 1981, Ser. No. 303,173
Int. Cl.³ A47L *23/22*; B32B *3/30*
U.S. Cl. 15—215 **7 Claims**



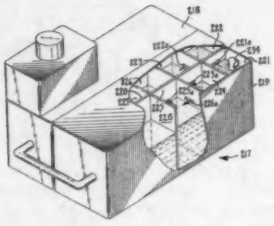
1. A foot mat of flexible, resilient material and comprising a base layer having a predetermined size and contour, and a plurality of discrete and mutually spaced projections integrally formed with and upstanding from said base layer, the projections being distributed over the area encompassed by said base layer and each rising to substantially the same height above the base layer whereby to present an interrupted but stable shoe-supporting arrangement elevated above the base layer with the spaces between the projections presenting debris-collecting regions, at least some of said projections having an array of radially extending ribs integrally formed therewith, the ribs of each such array being of progressively greater depth in the radial outward direction thereof, whereby to possess increasing elasticity in such radial outward direction and the ribs of

each such array merging centrally of the associated projection in a solid, central part thereof.

4,377,017
SCRUBBING MACHINE WITH WATER REGENERATION

Ferdinand J. Herpers, Minnetonka; Harley E. Kroll, Chaska; Alfred D. Carlson, Minneapolis, and Paul D. Dodge, Apple Valley, all of Minn., assignors to Tennant Company, Minneapolis, Minn.

Division of Ser. No. 916,929, Jun. 19, 1978, Pat. No. 4,199,263.
This application Nov. 19, 1979, Ser. No. 95,466
Int. Cl.³ A47L *11/30*
U.S. Cl. 15—320 **5 Claims**



1. A scrubbing device including a body portion suitable for movement along a surface to be scrubbed; a tank chamber for storing clean scrubbing solution;

applicator means for applying scrubbing solution from said tank chamber to a surface to be scrubbed, said applicator means including means for controlling the amount of scrubbing solution applied to said surface;

means for lifting dirty scrubbing solution from said surface;

separator means for receiving dirty scrubbing solution from said lifting means for separating said dirty scrubbing solution into a clean solution portion and a solid matter portion, said separator means comprising a series of interconnected settling chambers through which the scrubbing solution may sequentially travel, said settling chambers being defined by wall means, said wall means defining openings adjacent the surface of the upper portion of the solution contained in each chamber through which solution may flow;

whereby the solution is drawn into each chamber from the portion adjacent the upper surface of solution in the proceeding chamber;

and means for conveying said clean solution portion from the final settling chamber of said series into said tank chamber.

4,377,018
CLEANING DEVICE FOR SURFACES

Gerald E. Cain, North Canton, Ohio, assignor to Roto Cleaner, Inc., North Canton, Ohio

Filed Jun. 24, 1981, Ser. No. 277,037
Int. Cl.³ A47L *11/30*
U.S. Cl. 15—322 **26 Claims**

1. A mobile cleaning device for spraying a cleaning fluid under pressure toward a surface being cleaned, said device ;including:

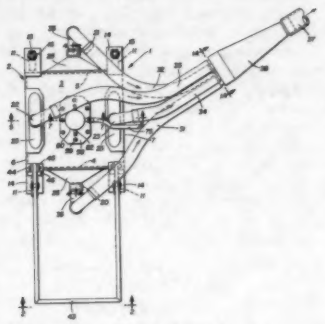
(a) a housing having top, front, rear and side walls and an open bottom, said walls forming a spray chamber therebetween;

(b) means mounted on the housing for movably supporting the housing on a surface being cleaned;

(c) exhaust duct means operatively connected to certain walls of the housing and communicating with the spray chamber for removing debris and spent cleaning fluid from the spray chamber, said exhaust duct means also being connectable to a source of suction for drawing said debris and cleaning fluid from the spray chamber;

(d) a plurality of nozzles rotatably mounted on the housing and located within the spray chamber for directing a spray of cleaning fluid toward the surface being cleaned;

(e) a manifold having a plurality of inlet openings and an outlet opening, said exhaust duct means being connected to the inlet openings and said outlet opening being connectable to a source of suction, with the total area of the inlet openings being approximately equal to the area of the outlet opening;



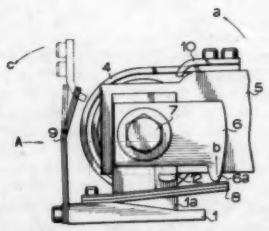
(f) fluid rotor means mounted on the housing and rotatably mounting the nozzles on said housing, said fluid rotor means being connectable to an incoming source of cleaning fluid with said incoming fluid providing the sole source of power to rotate the nozzles within the spray chamber; and

(g) adjustment means operatively engageable with the housing for raising the open bottom of the housing a predetermined distance above the surface being cleaned to form air passages between said surface and the bottom edges of the housing walls, with the total areas of the air passages being approximately equal to the total area of the exhaust duct openings.

4,377,019
RESILIENT HINGE WITH COIL SPRING ON PINTLE

Jun Takahashi, Aikawa, Japan, assignor to NHK Spring Co., Ltd., Yokohama, Japan

Filed Jun. 25, 1981, Ser. No. 277,283
Claims priority, application Japan, Jun. 25, 1980, 55-86206
Int. Cl.³ E05F *1/12*
U.S. Cl. 16—307 **2 Claims**



1. A hinge device provided with:

a fixed member for fixing said hinge device to a fixed body, said fixed member having an apertured plate body; a core bar which supports a rotation member and which is rotatably inserted into said aperture having a deformed noncircular area provided in said plate body and having a wall

portion so as to have a suitable degree of rotative freedom to vary the rotation moment of said rotation member in accordance with an angle of rotation;

a flat wire torsion spring having a substantially spiral shape and fixed at the inner end thereof to said core bar and the outer end thereof to said rotation member, respectively;

a lever member fixed to one end of said core bar;

a first flat spring fixed to said fixed member and in abutting relationship to said lever member to bias said core bar in a rotational direction through said lever member, thereby rotationally urging said core bar toward said wall of said aperture in said plate body;

a second flat spring fixed at one end to said fixed member and having its other end extending therefrom in abutting relationship to said rotation member at the point where the rotational moment thereof is minimum and operating to counteract the spring force of said flat wire torsion spring; the torque of said flat wire torsion spring having a spring force more than that of said first flat spring and adapted to revolve said core bar in a direction opposite to the rotational direction of said first flat spring acting on said lever member and within a range of motion up to the maximum rotation moment, and the difference between the combined spring characteristic of said first and second flat springs, said flat wire torsion spring, and said rotation member, is such as to be within a range wherein said difference can be absorbed by the rotative friction of said rotation member.

4,377,020

BI-ROTATIONAL HINGE

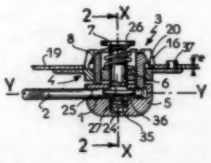
Gilles Vigo, Thillot, France, assignor to Compagnie Industrielle de Mecanismes, France

Filed Mar. 23, 1981, Ser. No. 246,485

Claims priority, application France, Mar. 21, 1980, 80 06312

Int. Cl.³ E05D *7/04*

U.S. Cl. 16—329 **11 Claims**



1. A device for mounting a support and articulation arm of a sun-glare shield of a vehicle, the device comprising a support for detachably fixing on a roof element of the vehicle in alignment with an opening in said roof element, the support defining a substantially verticle first aperture, a bearing defining a substantially vertical second aperture which is coaxial with the first aperture and a substantially horizontal third aperture for receiving the arm for rotation of the arm in the second aperture, the second and third apertures intersecting each other, a pull-rod defining a substantially horizontal orifice for the passage of the arm and engaged in the first and second apertures so as to rotatively mount the bearing on the support, and elastically yieldable means interposed between the support and the pull-rod and biasing the pull-rod upwardly for angularly positioning said bearing in at least one position relative to said support comprising at least one projection on said bearing and said cavity means on a support engageable by said projection.

4,377,021

APPARATUS FOR OPENING AND MIXING FIBROUS MATERIAL, E.G. COTTON

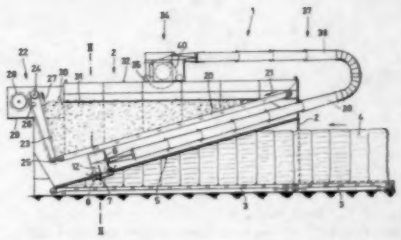
Franz Peters, Dülmen, Fed. Rep. of Germany, assignor to Hergeth KG Maschinenfabrik und Apparatebau, Dülmen, Fed. Rep. of Germany

Filed Aug. 4, 1980, Ser. No. 174,872

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1979, 2931500

Int. Cl.³ D01G *13/00*

U.S. Cl. 19—80 R **16 Claims**



1. A system for opening and mixing bales of fibrous material comprising means for feeding bales of fibrous material along a first path of travel in a first direction from an input end toward an end remote therefrom, means for defining an inclined surface against which bales are urged by said feeding means during the movement of said bales in said first direction, said inclined surface having opposite ends disposed remotely from and more closely adjacent to said respective input and remote ends of said path of travel, said inclined surface defining an acute angle with said feeding means, means for removing the fibrous material from the bales thereof, means for moving said fibrous material removing means along a second path of travel during the operation thereof, means above said inclined surface for collecting the removed fibrous material, said collecting means including means for moving the collected fibrous material along a third path of travel in a direction corresponding to said first direction generally parallel to said inclined surface between an input end of said third path toward an end remote therefrom, said first path remote end and third path remote end being contiguous each other, means for discharging the collected fibrous material from said collecting means at an area of maximum depth of the collecting means and the selected fibrous material therein, and said area of maximum depth being located generally above and contiguous said third path remote end.

4,377,022

SEPARABLE SLIDE FASTENER

Shunji Akashi, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Continuation of Ser. No. 53,081, Jun. 28, 1979, abandoned. This application May 22, 1981, Ser. No. 266,482

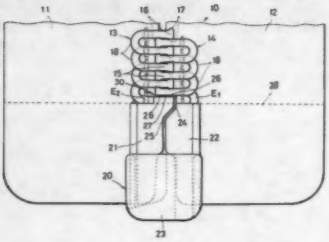
Claims priority, application Japan, Jul. 12, 1978, 53-95868[U]

Int. Cl.³ A44B *19/00*

U.S. Cl. 24—205.11 R **5 Claims**

1. A separable slide fastener having a slider adapted to open and close the fastener and comprising a pair of stringer tapes each carrying a row of coupling elements in the form of a continuous, helically coiled filament along one longitudinal edge, each of said coupling elements including a pair of spaced legs supported on one of said tapes, a coupling head extending between said legs and connecting portions extending respectively from said legs remotely from said coupling head and connected to adjacent two of coupling elements, the coupling head of each coupling element having a pair of interengageable lateral projections extending longitudinally of the respective row of coupling elements beyond the width of the respective

legs so that the rows of coupling elements can be interlocked in interdigitating relation by said lateral projections, and a separable terminal assembly comprising a separable pin fixed to the bottom end portion of one of said stringer tapes, a retainer pin fixed to the bottom end portion of the other stringer tape and a retainer formed integrally with said retainer pin for receiving therein said separable pin, the coupling heads of said endmost confronting pair of coupling elements having respective con-



fronting flattened surfaces formed by removing said interengageable lateral projections thereof and positioned to allow said pair of coupling elements to have a limited relative movement capability facilitating the opening and closing action of the slider at said separable terminal assembly without mutual interference of said pair of coupling elements, said separable pin and said retainer pin being integral with said endmost coupling elements.

4,377,023

DEEP BORING MILL WITH A SYNCHRONEOUSLY OPERATING HEADSTOCK

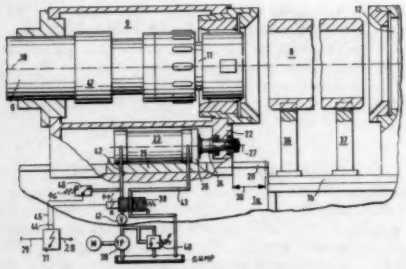
Theo Boesch, Wegberg, Fed. Rep. of Germany, assignor to Wilhelm Hegenscheidt Gesellschaft mbH, Erkelenz, Fed. Rep. of Germany

Filed Nov. 24, 1980, Ser. No. 210,012

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1979, 2948693

Int. Cl.³ B23B *45/14*

U.S. Cl. 29—27 R **3 Claims**



1. A deep boring apparatus, comprising machine bed means (1), headstock means (3) with means to support a boring tool and operatively supported on said machine bed means for movement back and forth on said machine bed means, tailstock means (12) with means to support a workpiece and operatively supported on said machine bed means (1), cooling medium supply means (9) having means for receiving said boring tool and means for clamping said workpiece and movably supported on said machine bed means (1) intermediate said headstock means (3) and said tailstock means (12), first drive means (5) operatively connected to said headstock means (3) for moving the headstock means (3) back and forth along said machine bed means, second drive means (23) operatively connected to said supply means (9) for moving the supply means (9) back and forth along said machine bed means (1), synchronizing means (13, 15) operatively connected to said first and second drive means for synchronizing the displacement movements of said headstock means (3) and of said supply means (9) and means controlling said synchronizing means to be operable only during the workpiece clamping phase and during the workpiece release phase of said displacement movements without a synchronization during a boring operation.

4,377,024

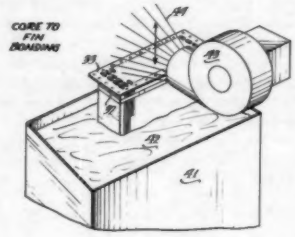
METHOD OF MAKING A HEAT EXCHANGER

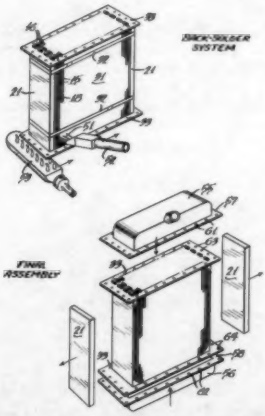
Zalman P. Saperstein, Gurnee, Ill., assignor to Modine Manufacturing Company, Racine, Wis.

Filed Apr. 2, 1981, Ser. No. 250,111

Int. Cl.³ B23P *15/26*; B23K *31/02*

U.S. Cl. 29—157.3 C **8 Claims**





1. In making a weldment heat exchanger having an air side core of spaced tubes and interconnecting fins extending between liquid tanks, the method comprising:

(a) stacking solder-coated welded core tubes in a plurality of spaced sets of a plurality of spaced tubes each with serpentine fins arranged between each adjacent pair of tube sets;

(b) arranging end rigid support plates against each of the end tube sets to provide a stack;

(c) applying compression to the resulting stack through said support plates, the tubes having substantially coplanar ends projecting beyond the sides of the stack;

(d) banding said stack into an easily handled rigid assembly by applying a plurality of spaced, taut tie bands around the support plates and encircling said stack;

(e) applying a header plate to each side of the assembly with

said tube ends extending through corresponding holes in the header plates;

(f) gang welding said projecting ends to the exterior of said header plates by means of a movable, multi-head, automatic welder;

(g) dipping the resulting core assembly into a liquid soldering flux;

(h) blowing heated air at a temperature above the melting point of said solder over the outer surfaces of said core assembly to bond the fins and tubes together;

(i) blowing a flowing mixture of solder and flux over the adjacent junction areas of the tubes and header plates that are opposite to the location of said welds, the welds thereby being on the liquid side of the heat exchanger and the solder mixture on the air side;

(j) heating said adjacent areas of the tubes and header plates to melt said solder mixture and thereby coat the said adjacent areas of the tubes and header plates with solder to seal the air side of the welds at said adjacent areas against any leakage opening that may occur in the welds;

(k) removing said end support plates and spaced bands from said core; and

(l) attaching a tube enclosing liquid tank to each of said header plates in fluid tight relation.

4,377,025

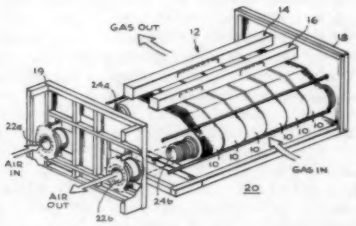
METHOD OF MOUNTING HEAT EXCHANGER SUPPORT SYSTEM

John F. Masai, Carson, and Fred W. Jacobsen, Garden Grove, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 955,115, Oct. 26, 1978, Pat. No. 4,263,964. This application Dec. 29, 1980, Ser. No. 220,548

Int. Cl.³ B23P *19/00*

U.S. Cl. 29—434 **9 Claims**



1. A method of mounting two adjacent sets of flexible suspension links, each including a plurality of U-bolts, comprising:

mounting the two sets of links between a suspension member and a structure to be supported thereby so that the U-bolts of one set are respectively orthogonally aligned with the U-bolts of the other set to prevent interference between the two sets.

4,377,026

SYSTEM FOR SECURING COMPONENT LEADS TO PRINTED CIRCUIT BOARDS

George J. Whitley, Philadelphia, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 14, 1979, Ser. No. 75,585

Int. Cl.³ B23P *19/00*; **H05K** *3/30*

U.S. Cl. 29—564.1 **9 Claims**

1. In an apparatus including conveying means for supporting and transporting a printed circuit board, apparatus for processing leads of components inserted in apertures in said board while on said conveying means and positioned over the lap of an operator comprising:

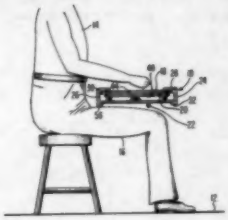
support means,

vertical displacement means mounted on said support means,

a horizontal member mounted on said displacement means for displacement in a vertical path,

component lead processing means secured to said member, and

displacement means operating means for displacing said member and said processing means toward said printed circuit board with said processing means aligned with said apertures, said support means, displacement means, member and processing means having a maximum vertical height of a few inches below said circuit board, said pro-



cessing means including lead cutting means for trimming said leads, and said cutting means including a bearing member mounted to said horizontal member, a rotatable shaft within said bearing member, drive means for rotating said shaft in opposite angular directions secured to the bearing member while said processing means is displaced toward said printed circuit board, and a straight edge lead cutting and bending means on an end of said shaft and rotatable therewith for rotating said straight edge cutting and bending means in a plane normal to said shaft and parallel to said board.

4,377,027

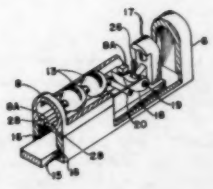
FISHLINE SINKER APPLICATOR

Thomas J. Price, Rte. 1, Lynchburg, Tenn. 37352

Filed Aug. 1, 1980, Ser. No. 174,677

Int. Cl.³ B23P *19/00*; **B23Q** *7/10*; **B11D** *9/00*

U.S. Cl. 29—566.1 **5 Claims**



1. A fishline sinker applicator comprising:

an elongated sinker assembly comprising a plurality of generally upper located semi-spherical sinkers having upper positioned and aligned V-shaped slots having surfaces, each slot being configured by the absence of a segment of the spherical shape of a sinker, and the sinkers being serially interconnected by a lower located narrow connecting sprue;

a frame;

a barrel assembly supported by said frame and including a barrel sized to receive said sinker assembly within said barrel, and including:

a first opening in one end,

a second opening in one side of the barrel adjacent to said one end, and

a third opening in a side of said barrel generally opposite to the side having said second opening and also being adjacent to said one end;

spring means for urging said sinker assembly toward said one end;

operating means mounted on said frame and movable in response to the application of an external force, and including first and second force members operably connected together and extending, respectively, through said first and third openings for contacting a said sinker and sprue, and upon movement of said force members against a sinker for crimping said surfaces about a fishing line and severing the sprue and thus separating a severed sinker from said sinker assembly;

said severed sinker being thus positioned to be removed from said barrel through said second opening.

4,377,028

METHOD FOR REGISTERING A MASK PATTERN IN A PHOTO-ETCHING APPARATUS FOR SEMICONDUCTOR DEVICES

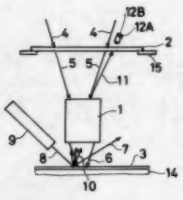
Issei Imahashi, Yamanashi, Japan, assignor to Telmec Co., Ltd., Nirasaki, Japan

Filed Dec. 8, 1980, Ser. No. 213,960

Claims priority, application Japan, Feb. 29, 1980, 55-25007

Int. Cl.³ H01L *21/312*

U.S. Cl. 29—574 **6 Claims**



1. A method for registering a pattern on a mask plate with a pattern already formed on a semiconductor wafer; characterized by the steps of forming at a predetermined position on said wafer a reflector group which consists of a plurality of reflectors of predetermined shape aligned at a predetermined pitch along a predetermined direction; forming first and second window groups at predetermined positions on said mask plate in correspondence to the position of said reflector group on the wafer, each window group consisting of a plurality of windows of predetermined shape aligned at the same predetermined pitch along the same direction as the reflector group, one window group being provided with a staggered phase relationship equal to a multiple of one half of said predetermined pitch with respect to the other window group; moving one of said wafer and said mask plate relative to the other in the direction of alignment of the reflectors and windows while irradiating said reflector group with light; providing first and second detecting means for determining the quantity of light reflected by the reflector group and passing through said first and second window groups, respectively; and determining the relative position of the wafer and the mask plate by determining when the detected respective quantities of light take a predetermined proportion to thereby register the pattern on said mask plate with the pattern already formed on said semiconductor wafer.

4,377,029

PROCESS FOR FABRICATING A BIPOLAR INTEGRATED CIRCUIT HAVING CAPACITORS

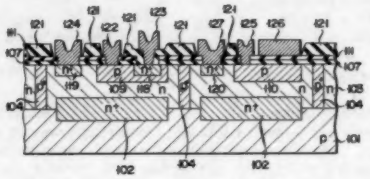
Osamu Ozawa, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 8, 1980, Ser. No. 213,919

Claims priority, application Japan, Dec. 15, 1979, 54-163242

Int. Cl.³ H01L *27/04, 27/02*

U.S. Cl. 29—576 B **5 Claims**



1. A process for fabricating a bipolar integrated circuit having a capacitor comprising the steps of:

forming isolation regions in an epitaxial layer of a second conductivity type formed on a semiconductor substrate of a first conductivity type;

forming a thermal oxidation layer on the surface of said epitaxial layer;

forming a diffusion region of the first conductivity type for a lower part electrode by selectively implanting by ion implantation an impurity of the first conductivity type in a capacitor-forming region surrounded by a said isolation region throughout said thermal oxidation layer and annealing thereafter; forming a diffusion region of the second conductivity type for an external electrode by selectively diffusing an impurity of the second conductivity type into said capacitor-forming region through a contact hole formed in said thermal oxidation layer; and

forming a contact hole for exposing part of said diffusion layer of the first conductivity type; and forming a metal layer for electrodes on the surface of said epitaxial layer containing said thermal oxidation layer and selectively removing said metal layer so as to simultaneously form a lower part electrode connected to said diffusion region of the first conductivity type, an external electrode connected to said diffusion region of the second conductivity type, and an upper part electrode covering a large area of said thermal oxidation layer located above said diffusion layer of the first conductivity type,

wherein said thermal oxidation layer forms the insulation layer of a capacitor interposed between said lower part electrode diffusion layer and said upper part electrode of the capacitor region.

4,377,030

METALLIZATION OF SELECTIVELY IMPLANTED A_{III}-B_V COMPOUND SEMICONDUCTORS

Ewald Pettenpaul, Unterhaching; Jakob Huber, Aying, and Herbert Weidlich, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 11, 1981, Ser. No. 233,329

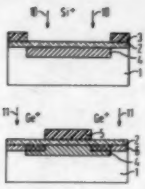
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1980, 3005733

Int. Cl.³ H01L *29/48, 29/56, 21/265*

U.S. Cl. 29—576 B **7 Claims**

1. Method for fabricating a semiconductor arrangement using phototechnique processes and a semiconductor body of an A_{III}-B_V compound, which comprises doping a semiconductor body of an A_{III}-B_V compound with a first doping substance in a concentration to produce non-barrier zones at parts of the surface of the semiconductor body, and with a second

doping substance in a concentration to produce barrier zones at other parts of the semiconductor surface, and applying only



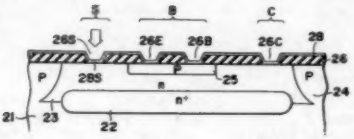
one metallization to the surface to obtain barrier and non-barrier contacts on the different zones.

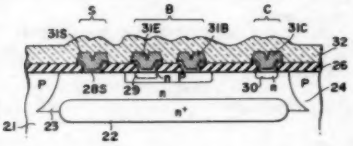
4,377,031

METHOD OF MAKING SCHOTTKY BARRIER DIODE BY SELECTIVE BEAM-CRYSTALLIZED POLYCRYSTALLINE/AMORPHOUS LAYER

Hiroshi Goto, Yokohama, and Kenji Sugishima, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 1, 1981, Ser. No. 249,833
Claims priority, application Japan, Apr. 10, 1980, 55-47347
Int. Cl.³ H01L *21/26, 21/263*
U.S. Cl. 29—576 B **7 Claims**





1. A method of manufacturing a semiconductor device comprising the steps of:

forming an insulating layer on a semiconductor substrate;

selectively removing the insulating layer until the top surface of the semiconductor substrate is exposed to open a plurality of windows, including a window in which to form a Schottky barrier diode and windows in which to form electrodes;

forming a polycrystalline or amorphous semiconductor layer covering the exposed surface of the semiconductor substrate and the remaining insulating layer;

applying an energy beam to the polycrystalline or amorphous semiconductor layer at least in the window in which to form the Schottky barrier diode to convert the polycrystalline or amorphous semiconductor layer ito a single-crystal semiconductor layer;

depositing a Schottky barrier diode forming metal layer on the single-crystal semiconductor layer to form a Schottky barrier contact between the metal layer and the single-crystal semiconductor layer; and

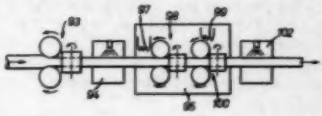
depositing an electrode forming metal layer on the semiconductor layer in each of the windows in which to form electrodes to form an ohmic contact between the metal layer and the semiconductor layer.

4,377,032

SUPERCONDUCTING CABLE

Hans Benz, Zurich, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Division of Ser. No. 141,253, Apr. 17, 1980, Pat. No. 4,336,420.
This application Nov. 4, 1981, Ser. No. 318,063
Claims priority, application Switzerland, Jun. 5, 1979, 5183/79
Int. Cl.³ H01L *39/24*
U.S. Cl. 29—599 **1 Claim**



1. A process for producing a superconducting cable containing a plurality of wires, each having a majority of superconducting filaments embedded in a matrix material, said wires being roped or plaited and soldered to form wire bundles which are then stranded or plaited to form rope which is in turn stranded or plaited to form cable, wherein the wire bundles in the rope are materially connected together or to neighboring ropes in the area of their points or lines of contact in order to increase the mechanical strength and improve the thermal and electrical conductivity as well as for a more effective matrix cooling, comprising:

coating said plurality of wires with a thin layer of solder;

pre-compressing said ropes of wire bundles to a predetermined cross-section;

impregnating the pre-compressed and coated ropes with a flux;

heating the impregnated ropes above the melting point of the solder;

cooling said heated ropes while con-currently deforming and compressing the heated ropes to a predetermined final cross-section; and

washing off surplus flux from the cooled ropes.

4,377,033

INTEGRATED CARBON/INSULATOR STRUCTURE AND METHOD FOR FABRICATING SAME

John E. Barnes, Wakefield; Franz Goebel, Sudbury, and William T. McHugh, Westwood, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Division of Ser. No. 159,266, Jun. 13, 1980, Pat. No. 4,296,187.
This application Apr. 6, 1981, Ser. No. 251,622
Int. Cl.³ H01M *6/14*
U.S. Cl. 29—623.5 **15 Claims**

1. A method for fabricating an integrated carbon/insulator structure for an electrochemical cell, comprising the steps of:

depositing a quantity of a wet carbon slurry material onto a porous sheet of an electrically-nonconductive substrate material;

physically working the quantity of wet carbon slurry material as deposited onto the sheet of electrically-nonconductive substrate material in the previous step across the porous sheet of electrically-nonconductive substrate material to achieve a layer of desired thickness for the carbon

slurry material and to cause a portion of the carbon slurry material to diffuse into the surface of the porous sheet of substrate material and permanently adhere to and unite with a portion of the sheet of substrate material in an integrated, interlocking fashion;

drying the sheet of substrate material having the layer of carbon slurry material integrated therewith to cause the layer of carbon slurry material to dry and shrink to the form of a layer of carbon plaque comprising an aggregation of porous carbon globules and having a network of cracks produced therethrough in a random pattern as a result of the shrinkage during drying; and

physically reworking the layer of carbon plaque to close cracks at the upper surface of the layer of carbon plaque while simultaneously maintaining a desired thickness for said layer.

4,377,034

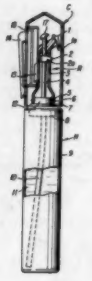
SAFETY RAZOR KIT

Alex F. Druash, P.O. Box 328, Seabrook, Md. 20801, and Denis P. Druash, 2104 Rosemont Dr., Columbus, Ga. 31904

Filed Nov. 10, 1980, Ser. No. 205,871

Int. Cl.³ B26B *21/44*

U.S. Cl. 30—41 **7 Claims**



1. A safety razor kit comprising a razor head assembly and a handle component of at least a disposable, pre-packaged, pressurized unit of shaving cream or gel operatively connected to said razor head assembly for dispersement of it contents through said assembly and a valve mechanism and associated opening in said assembly for said dispersement; said assembly comprising an elongated head element having a first element mounted perpendicularly thereto on one end to hold a disposable razor cartridge for shaving, a bracket on the lower portion of said element and mounted parallel to the long axis of said head element to store said cartridge, a flared base element on the other end of said head element to engage said handle component, and a passageway extending inwardly from said base element into said head element to receive a spring-biased dispenser spout from said handle component which is selectively contacted by said valve mechanism which is slidably positioned in said passageway.

4,377,035

CULTRY PLACE SETTING

Ernst-Wilhelm F. Dalichow, Solingen, Fed. Rep. of Germany, assignor to Heinr. Boker GmbH & Co. Baumwerk, Solingen, Fed. Rep. of Germany

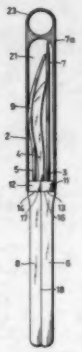
Filed Mar. 12, 1981, Ser. No. 242,927

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1980, 3011772

Int. Cl.³ A47G *21/06*

U.S. Cl. 30—147 **8 Claims**

1. A cutlery place setting comprising a knife, said knife including a handle portion, a fork, said fork including a handle portion, a spoon, said spoon including a handle portion, a holder, and said knife, fork and spoon detachably housed together held by said holder, said handle portions adapted to extend outward of said holder.



4,377,036

PRECISION MEASURING APPARATUS HAVING A MEASURING INTERVAL SEALED FROM ENVIRONMENTAL INFLUENCES

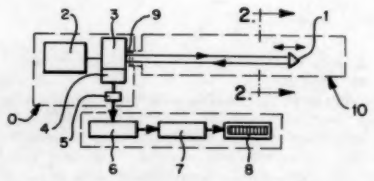
Holmer Dangschat, Traunwalchen, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Feb. 17, 1981, Ser. No. 234,489

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1980, 3006489

Int. Cl.³ G01B *9/02, 11/02*

U.S. Cl. 33—125 A **13 Claims**



1. In an improved precision measuring apparatus defining a measuring interval sealed from environmental influences, the apparatus including a shielding housing surrounding the measuring interval and defining within the housing wall a slit oriented along the measuring interval, a movable member attachable to a measured object and movable along the measuring interval, and a carrying member attached to the movable member and extending through the slit, the improvement comprising:

fluid bearings interposed between the movable member and the shielding housing to form a bearing gap therebetween, the fluid bearings positioned to movably support the movable member on the shielding housing substantially without friction; and

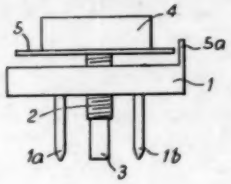
sealing fluid positioned in the bearing gap to seal the slit.

4,377,037

DEVICE AND METHOD FOR THE MEASUREMENT OF THE THICKNESS OF A WET COATING

James C. Taylor, Ravenhurst, Sycamore Ave., Heywood, England

Filed Feb. 17, 1981, Ser. No. 235,031
Claims priority, application United Kingdom, Feb. 13, 1980, 8003042
Int. Cl.³ G01B 5/06
U.S. Cl. 33—169 F 10 Claims



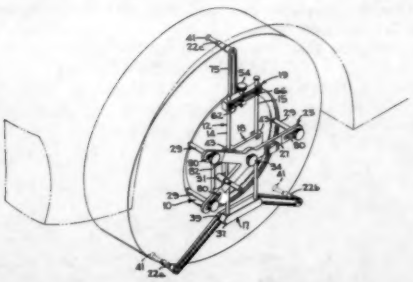
1. A device for the measurement of the thickness of an opaque wet coating on a solid substrate, the device comprising a frame; at least two legs extending from the frame and having free ends which may be applied to the substrate; a probe movable with respect to the frame towards and away from the level of the free ends; and an indicator for indicating the position of the probe, the probe having a tip which is light-conducting, the tip having a bottom surface engageable with the opaque wet coating and a sidewall extending upwardly from the bottom surface, the bottom surface and the sidewall being transparent to light such that the opaque wet coating is observable through the sidewall when the bottom surface is in contact with the opaque wet coating, whereby the position at which the tip makes contact with the opaque wet coating may be observed.

4,377,038

TRUCK WHEEL CLAMP WITH FLOATING SPINDLE PLATE

Marshall P. Ragan, Mayflower, Ark., assignor to FMC Corporation, Chicago, Ill.

Filed Feb. 19, 1981, Ser. No. 235,885
Int. Cl.³ G01B 5/255
U.S. Cl. 33—203.18 6 Claims



1. A wheel clamp for supporting a wheel aligning tool in a plane parallel to the plane of a wheel, said wheel including both a tire and a rim, comprising:

a first frame;

means attached to the first frame for firmly grasping the periphery of the tire;

a second frame for supporting the wheel aligning tool;

means attached to the second frame for maintaining the plane of said second frame parallel to the plane of the wheel, whereby the aligning tool is supported in a plane parallel to the plane of the wheel; and

means for permitting pivotal movement of the second frame into non-parallel relationship with said first frame and for securing the second frame thereafter in fixed position relative to the first frame when the second frame is in said plane parallel to the plane of the wheel.

4,377,039

PROCESS FOR THE DRYING OF WOOD BY USE OF DIELECTRIC ENERGY

Bror O. Höger, Forsetevagen 5, S-182 63 Djursholm, Sweden

Filed Jul. 24, 1981, Ser. No. 286,675
Int. Cl.³ F27B 3/34, 3/00, 5/04
U.S. Cl. 34—1 18 Claims

1. A method for the drying of wood which comprises heating wood to be dried in a closed container under reduced pressure in a drying oil, said wood being at least partially heated by means of dielectric energy and said pressure being reduced sufficiently to cause moisture present in the wood to be removed therefrom, thereafter removing said drying oil from contact with the wood upon removal of the desired amoung of moisture from the wood while maintaining the wood under reduced pressure to permit residual oil and moisture to evaporate therefrom, and recovering said wood.

4,377,040

PROCESS FOR THE MODIFICATION OF WOOD

Eberhard Giebeler; Bernhard Bluhm, both of Duisburg; Arnold Alscher, Ladenburg; Klaus Morsw, Duisburg; Gerd Collin, Duisburg, and Heinzpeter Nilles, Duisburg, all of Fed. Rep. of Germany, assignors to Rütgerswerke Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Apr. 21, 1980, Ser. No. 142,576
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1979, 2916677
Int. Cl.³ F26B 5/04
U.S. Cl. 34—16.5 7 Claims

1. A method for the modification of wood in order to obtain dimensional stability which comprises subjecting wood which has a moisture content not greater than 8% to a heat treatment at an elevated temperature of from 160° C. to 240° C. in a closed heatable vessel under pressure, said vessel having been evacuated prior to the heat treatment to exclude oxygen in excess of 10 volume percent and permitting products escaping from the wood during the thermal treatment to remain in the reaction vessel for the entire reaction time, and thereby obtaining a dimensionally stable wood product which will be resistant to formation of cracks.

4,377,041

ATHLETIC SHOE SOLE

Stephen L. Alchermes, 47 Southfield Rd., Glen Cove, N.Y. 11542

Filed Jun. 26, 1980, Ser. No. 163,051
Int. Cl.³ A43B 13/12, 13/14
U.S. Cl. 36—30 R 4 Claims

1. An improved design for an athletic shoe sole comprising:

(a) an exterior surface fabricated so as to provide traction with an exterior surface upon which said sole has physical contact;

(b) an inner layer coincident with and physically attached to

said exterior surface having an insert fabricated from a material whose characteristics of compression and expansion vary from that of said inner layer, said insert occurring within said inner layer so as to be coincident with metatarso-phalangeal joints of a wearer of an athletic shoe having said sole; and

(c) said insert having characteristics of compression and expansion such that the maximum pressure required to cause flexion at the anterior break of said athletic shoe sole which coincides with the wearer's metatarso-phalangeal joints is six pounds of pressure.

4,377,042

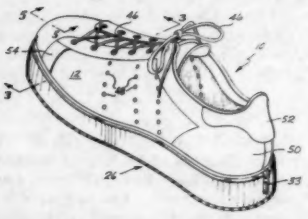
FOOTWEAR HAVING REMOVABLE SOLE

Peter Bauer, 5500 132 NE., Bellevue, Wash. 98005

Continuation-in-part of Ser. No. 61,924, Jul. 30, 1979. This application Jan. 19, 1981, Ser. No. 226,231

Int. Cl.³ A43B *3/24;* **A43C** *13/00*

U.S. Cl. 36—101 **5 Claims**



1. A shoe comprising an upper; an insole connected with the upper, said insole terminating along its peripheral margins in one part of a longitudinally extending bead and longitudinally extending and mating recess mechanical locking means, said longitudinally extending bead part comprising beads which have a neck portion and a head portion relatively larger than said neck portion; a removable outsole; and a flexible member connected with said outsole, extending outwardly of said insole, and terminating along its peripheral margins with the other part of the longitudinally extending bead and longitudinally extending recess mechanical locking means, said flexible member flexing inwardly and outwardly and permitting entrance and exit of said bead part into and out of said mating recess.

4,377,043

SEMI-AUTOMATIC HYDRAULIC EXCAVATOR

Takayasu Inui; Kazuo Ootsuka; Saburo Nogami, all of Hirakata; Michiaki Igarashi, Yokosuka; Toshiaki Horikoshi, Kamakura, and Kazuhiro Izumi, Isehara, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 31, 1980, Ser. No. 221,564

Claims priority, application Japan, Jan. 7, 1980, 55-450

Int. Cl.³ E02F *3/00, 9/26*

U.S. Cl. 37—18 R **4 Claims**

1. A semi-automatic hydraulic excavator which includes a boom, an arm and a bucket having a movable bottom, said excavator comprising:

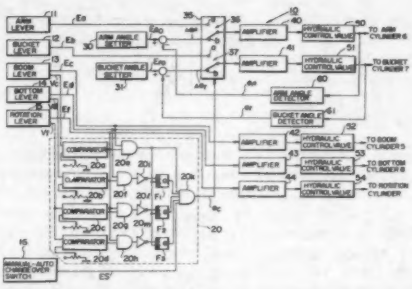
an arm control means for controlling the arm of said excavator automatically and manually;

a bucket control means for controlling the bucket of said excavator automatically and manually and;

one or more additional control means for manually controlling additional elements of the excavator, wherein the additional control means includes means for rotating the excavator under control of a rotation lever, means for moving the bucket bottom under control of a bottom lever and means for moving the boom under control of a boom lever;

detection means for producing signals representing rotation lever directional movement, bottom lever movement and boom lever movement;

an automatic control circuit which controls, upon detection of a signal corresponding to the fact that said excavator has completed a predetermined work procedure, said arm control means and said bucket control means to place them in an automatic control mode; wherein said automatic control circuit logically combines signals from the detection means respectively corresponding to the facts that the rotation lever is operated in one direction, said rotation lever is then operated in the reverse direction, the bottom lever is operated and that the boom lever is operated downward;



said arm control means being designed to control said arm during the automatic control mode so that an arm angle thereof becomes coincident with a fixed preset value corresponding to an original excavation posture, said bucket control means being designed to control said bucket during the automatic control mode so that a bucket angle thereof becomes coincident with a preset value corresponding to the original excavation posture, whereby, upon completion of dumping work, said bucket is swiftly brought back to the original excavation posture by simultaneous manual operation of the additional control means and automatic operation of the arm control means and bucket control means.

4,377,044

SNOW THROWER WITH DUAL CONTROLS

Charles C. Krug, Saginaw, Tex., assignor to K & S Industries, Inc., Saginaw, Mich.

Filed Feb. 23, 1981, Ser. No. 236,663

Int. Cl.³ E01H *5/09;* **H01H** *9/06*

U.S. Cl. 37—245 **1 Claim**

1. In a bulk material moving device of the type having a housing containing an electrical motor and an impeller driven by the motor, and a tubular handle extending upwardly and rearwardly from the housing, an improved means for operating and controlling the device, comprising:

a lower handgrip carried on the handle at the forward end joining the housing;

an upper handgrip mounted to the rearward end of the handle, the upper handgrip having a forward handgrip portion with an axis that coincides with the axis of the handle, and a rearward handgrip portion that extends downwardly from the forward handgrip portion;

an elongate forward trigger having a forward end pivotally mounted to the lower side of the forward handgrip portion and a movable end located within the upper handgrip at the junction of the forward and rearward handgrip portions;

an elongated rearward trigger having a rearward end pivotally mounted to the lower side of the rearward handgrip portion and a movable end located within the upper handgrip at the junction of the forward and rearward handgrip portions; and

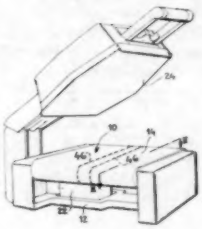
an electrical switch mounted inside the upper handgrip for contact with the movable ends of the triggers, the switch being electrically connected to the motor so that pivoting either trigger moves the switch to control the motor.

4,377,045

IRONING PRESS

Jean-Claude A. Aurensan, Bernieres-sur-Mer, France, assignor to Moulinex, SA, Bagnolet, France

Filed Feb. 24, 1981, Ser. No. 237,734
Claims priority, application France, Feb. 29, 1980, 80 04548
Int. Cl.³ D06F *69/02, 71/00*
U.S. Cl. 38—11 **6 Claims**



1. An ironing press comprising an ironing table, a heatable pressing plate arranged to be moved near to the ironing table for an ironing operation, two spaced parallel rollers supported by said table, an endless conveyor belt supported on said spaced rollers, and drive means arranged to rotate at least one of said rollers to drive the conveyor belt, the conveyor belt comprising a drive belt having an inner surface in engagement with said rollers, a flexible cushion carried on the outer surface of the drive belt, and an endless textile covering enclosing the outer surface of the flexible cushion, the textile covering being arranged to be driven by the cushion by friction between the outer surface of the cushion and the inner surface of the covering, and mutual alignment means arranged to bring the median longitudinal plane of said covering into coincidence with the median longitudinal plane of said drive belt.

4,377,046

TAG HOLDING BRACKET

Leland R. Johnson, Box 166, Dannebrog, Nebr. 68831

Filed Jan. 12, 1981, Ser. No. 224,454
Int. Cl.³ G09F *3/20*
U.S. Cl. 40—16.4 **12 Claims**

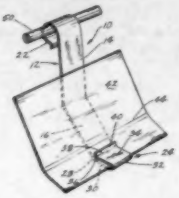
11. A tag holding bracket including,

an elongated base member having upper and lower ends and forward and rearward sides,

support means connected to said base member adjacent the upper end thereof whereby said base member is adapted for suspension from said support means,

said base member including upper and lower portions connected together at a first bend about a first axis directed generally transversely of said base member whereby said lower portion extends forwardly from said upper portion, and

a generally U-shaped channel connected to said base member adjacent the lower end thereof,



said channel including a rearward leg connected to said lower portion and extended downwardly and forwardly therefrom and a forward leg extending upwardly and rearwardly over said rearward leg and including a tag engaging surface so positioned that a straight line through the lower end of said rearward leg and tag engaging surface intersects said base member.

4,377,047

IDENTIFICATION BRACELET

William E. Adams, Jr., and James J. Carroll, both of Philadelphia, Pa., assignors to Medical I-D, Inc., Bala Cynwyd, Pa.

Filed Jan. 30, 1981, Ser. No. 229,962
Int. Cl.³ G09F *3/14*
U.S. Cl. 40—21 C **9 Claims**

1. A disposable hospital identification bracelet comprising a band portion adapted to encircle a limb of a wearer to secure the bracelet thereto, clasp means associated with said band portion for securing said bracelet in a limb-encircling configuration, means associated with said band portion for coupling to said band portion a likeness of the wearer, and means associated with said band portion for securing to said band portion other identifying indicia relating to the wearer, said means for coupling to said band portion a likeness of the wearer comprising an enclosure having an outwardly facing transparent portion thereof through which the likeness is visible and an open underside thereof facing the limb of the wearer when the bracelet is operatively disposed, and a self-closure member for said enclosure, a self-hinge interconnecting said self-closure member and said enclosure, said self-hinge being so located with respect to said enclosure and said self-closure member as to permit said self-closure member to be rotated beneath the

band portion to cover the underside of said enclosure when the bracelet is operatively disposed so that the limb of the wearer maintains said self-closure member in its operative disposition wherein it covers the underside of said enclosure, said band portion, said enclosure, said self-closure member and said self-hinge being integrally formed as a single piece of polymeric material.

4,377,048

DISPLAY RETAINING MEANS ASSEMBLY

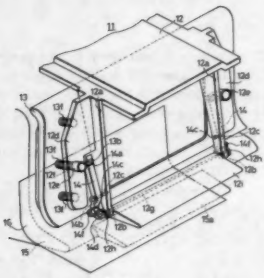
Susumu Takagi, Iwaki, and Nobuhiko Suzuki, Tokyo, both of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Nov. 27, 1981, Ser. No. 325,294

Claims priority, application Japan, Nov. 26, 1980, 55-169332[U]

Int. Cl.³ G02B *27/02*

U.S. Cl. 40—367 **5 Claims**



1. In an information display apparatus in which a sheet made of a light-transmitting material provided on the display surface of a cathode ray tube and information concerning the position of an automobile presented by said cathode ray tube are combined to provide a visible information of the present position of said automobile;

a sheet fixing device characterized by: a frame means, a sheet pressing member having sheet pressing portions movably mounted on said frame means; a plurality of independent biasing members spaced from one another and adapted to bias said sheet pressing member toward the display surface of said cathode ray tube; a sheet guide rotatably connected to said frame means; cams connected to said sheet guide and adapted to be rotated by said sheet guide; and sheet pressing member lifting levers pivotally mounted on said frame means and adapted to be actuated by said cams, said lifting levers connected to said sheet pressing member to position said sheet pressing member; whereby, when said sheet guide is rotated to a sheet take-out position, said cams actuate said sheet pressing member lifting levers to permit said sheet pressing member to be moved away from said display surface of said cathode ray tube.

4,377,049

CAPACITIVE SWITCHING PANEL

Donald R. Simon, Wayne, and Robert J. Strowe, Ramsey, both of N.J., assignors to PepsiCo Inc., Purchase, N.Y.

Filed May 22, 1980, Ser. No. 152,523

Int. Cl.³ G09F *11/00*; H01H *9/00*; G08C *9/00*; G07F *11/00*

U.S. Cl. 40—465 **6 Claims**

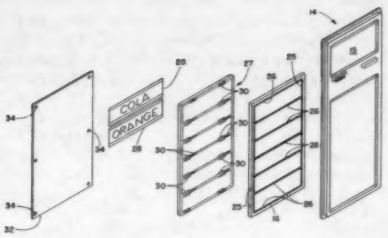
1. An improved selection panel for a vending machine having a plurality of touch-activated capacitive switches and the facility to readily change the visible indicia associated with each switch such that the visible indicia and the product associated therewith can be conveniently changed to change the products vended by the machine, comprising:

a. a transparent substrate;

b. first and second transparent conductive coatings on opposite sides of said substrate forming portions of each capacitive switch, with the transparent coatings allowing indicia positioned behind the coated substrate to be visible therethrough;

c. an opaque delineation pattern for the substrate for separating the different areas of the different capacitive switches;

d. a frame positioned behind and adjacent to said coated substrate for supporting a plurality of retangular indicia tabs associated with the plurality of switches such that the indicia tabs are supported adjacent to said coated substrate



and visible therethrough to indicate the type of product vended by each switch, said frame being substantially coextensive with said delineation pattern such that the lines of the delineation pattern obscure the members of the frame from view, said frame having two frame members on opposite sides of each capacitive switch providing opposed holders for each switch to support a rectangular indicia tab associated therewith such that the indicia associated with each switch is conveniently changeable by replacement of its indicia tab.

4,377,050

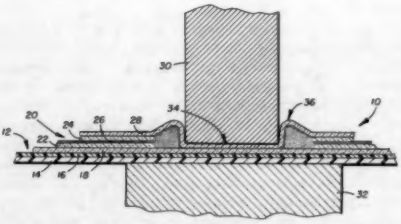
LAMINATED TAPE FOR IMPRINTING

Roy J. Renholts, 984 Customs Rd., Pebble Beach, Calif. 93953

Filed Jun. 1, 1981, Ser. No. 269,519

Int. Cl.³ G09F *19/00*; B32B *7/12*

U.S. Cl. 40—615 **12 Claims**



1. A laminated tape adapted for imprinting of indicia upon selected surface portions thereof, comprising

a suitable base layer,

a clear film forming an upper layer of the laminated tape,

an adhesive vehicle layer comprising two layer portions being arranged intermediate the base layer and the clear film, and

a color agent forming a layer intermediate the two adhesive layer portions to provide a selected color across the area of the tape as viewed through the clear film, the adhesive layer and color agent being generally viscous under normal conditions in order to assure adhesion within the laminated tape, the adhesive vehicle layer being extrudable under combined effects of heat and pressure applied to a selected surface portion of the tape to result in lateral

extrusion of the adhesive vehicle layer and the color agent away from the selected surface area.

4,377,051

FLYING DEVICES

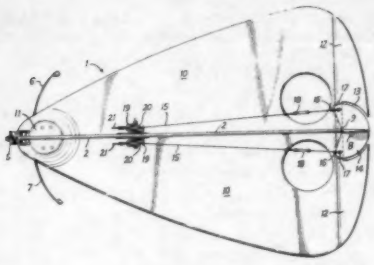
Robert F. Dulake, 69 Hazelmere Gardens, Hornchurch, Essex, England (RM11 2AS)

Filed May 4, 1981, Ser. No. 260,470

Claims priority, application United Kingdom, Aug. 15, 1981, 8026807

Int. Cl.³ A63H *27/04*

U.S. Cl. 46—77 11 Claims



1. A line controllable flying device comprising first air deflection means to effect on the flying device an aerodynamically induced lift force directed upwardly when said device is flying horizontally, second air deflection means mounted for pivotal movement in a manner to modify the airstream over said first air deflection means thereby to vary the magnitude and/or direction or said lift force, a pair of control lines operatively connected to said second air deflection means for effecting said pivotal movement thereof, a pair of like-dimensioned co-axial pulley wheels for enabling said control lines to pass respectively therearound and from said pulley wheels in an unrestricted manner such as to extend from one side of the flying device in unkinked condition and at an angle to the direction of flight of the flying device, said angle being continuously variable independently of effecting pivoted movement of said second air deflection means, third air deflection means to effect an aerodynamically induced lateral force on the flying device in a direction extending away from the other side of the flying device and of a magnitude sufficient to augment substantially any tension force component in the control lines due to centrifugal force, and fourth air deflection means to effect an aerodynamically induced turning force or moment upon said flying device in a direction tending to turn the flying device outwardly of the arcuate path of motion in which it is constrained to fly.

4,377,052

FOLDED PAPER AIRPLANE

James M. BonDurant, Box 99, Bowersville, Ohio 45307

Filed Sep. 30, 1981, Ser. No. 307,327

Int. Cl.³ A63H *27/00*

U.S. Cl. 46—79 10 Claims

1. A folded paper airplane comprising:

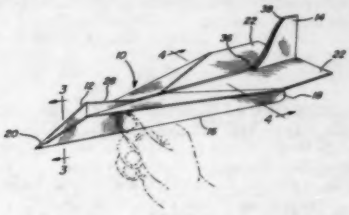
a blank of sheet material with a forward edge and a rear edge and having a downfold line extending centrally along an axis of the sheet material from said forward to said rear edge;

a pair of transverse cuts spaced from the rear edge of the blank for forming a tailpiece, said transverse cuts each having one end terminating at the downfold line and the other terminating at a respective upper edge forming a fuselage;

a pair of fuselage forming upfold lines each extending from adjacent a point of the transverse cut intersecting the downfold line to said forward edge at a respective point generally midway between the downfold line and a respective outer extremity of the blank;

a pair of cockpit forming downfold lines each extending from a respective said point generally midway of the forward edge to a cockpit area, and generally bisecting an angle formed by the associated fuselage upfold line and the forward edge;

a pair of sets of lines, each set comprising at least two succes-



sive upfold lines each extending also from a respective said point generally midway of the forward edge outwardly to an outer extremity of the blank and each set generally trisecting the angle between the associated fuselage forming upfold line and the forward edge of the blank; and

a pair of wing forming downfold lines each extending from the respective leading edge of a resulting wing surface to the other termination of the respective transverse cut.

4,377,053

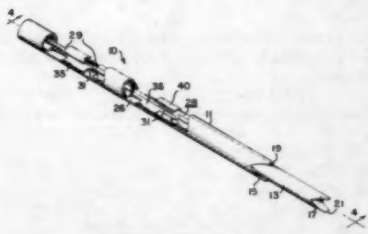
TELESCOPING PROP PARTICULARLY ADAPTED FOR SUPPORT OR SPREADING OF TREE BRANCHES

Doyle W. Roark, and Carolyn K. Roark, both of 1003 Malaga Ave., Wenatchee, Wash. 98801

Filed Apr. 3, 1981, Ser. No. 250,697

Int. Cl.³ A01G *17/06*

U.S. Cl. 47—42 4 Claims



1. A telescoping prop for support and/or spreading of tree branches comprising:

at least two elongated prop sections, the second section being configured so that it can nest inside the first section, wherein at least one end of the telescoping prop has a notch or the like formed therein for maintaining contact with the branch which the prop is to support; and

a first plurality of raised portions formed as an integral part of the interior surface of the first section and a second plurality of raised portions formed as an integral part of the exterior surface of the second section, said plurality of first and second raised portions being positioned at spaced intervals along the length of the first and second prop sections, respectively, said first plurality of raised portions being configured to mate with said second plurality of raised portions in a partially surrounding relationship

when the two sections are in a first rotational relationship, in any one of a plurality of different longitudinally extended positions, so that in the first rotational relationship substantially any longitudinal movement which would tend to shorten the prop is prevented, said first plurality of raised portions being further configured so that there is a longitudinal path on the interior surface of the first section along which the second plurality of raised portions can move longitudinally when the two sections are in a second rotational relationship, so that in the second rotational relationship, longitudinal movement of the first and second sections relative to each other to change the length of the prop is permitted.

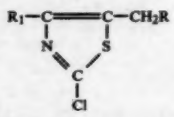
4,377,054

SEED COATED WITH 2-CHLORO-4,5-DISUBSTITUTED-THIAZOLE DERIVATIVES WHICH ARE HERBICIDAL SAFENERS

Robert K. Howe, Bridgeton, and Len F. Lee, Maryland Heights, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 80,751, Oct. 1, 1979, Pat. No. 4,284,426.
This application Aug. 28, 1980, Ser. No. 182,257
Int. Cl.³ A01C 1/06
U.S. Cl. 47—57.6 8 Claims

1. Sorghum seed, the plants grown from which are resistant to injury by a thiocarbamate or acetanilide herbicide, comprising crop seed coated with a safening effective amount of a compound having the formula



where R is equal to halogen, hydroxy, lower alkoxy, or benzyloxy,

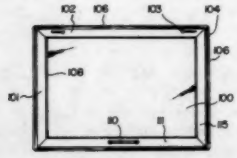
R_1 is lower alkyl, halo (lower) alkyl, phenyl or phenyl substituted by one to three groups, which may be the same or different, selected from the group consisting of halogen, lower alkyl, trifluoromethyl and cyano.

4,377,055

SEALING FRAME FOR USE IN WINDOW CASE

George L. Frederick, 1808 Juno Ave., Ottawa, Ontario, Canada (K1H 6S7)

Filed Apr. 7, 1981, Ser. No. 251,938
Claims priority, application Canada, Jan. 21, 1981, 368980
Int. Cl.³ E05D 7/08
U.S. Cl. 49—388 8 Claims



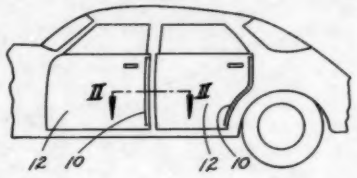
1. A frame for installation in a rectangular window case having pin receiving means thereon, said frame comprising a substantially planar rigid frame including four linear elements having first surfaces which together form an outer peripheral surface of said rigid frame which is rectangular, pivot pins mounted on said rigid frame, a compressible gasket attached to said linear elements, said compressible gasket being positioned adjacent said outer peripheral surface to provide an outer periphery which circumscribes the outer peripheral surface of said frame so that said gasket is adapted to be compressed between said outer peripheral surface and said window case when the window is closed, said pivot pins being positioned in an axis which is parallel to the plane of said frame and proximate to one side of said frame so that said frame is adapted to be mounted to permit it to be pivoted so that it may be positioned ajar of the window case, said pins being adapted to be positioned in said pin receiving means associated with said window case to permit pivotal movement of said frame about said axis whereby, when the window is open, the frame is held against movement by static frictional forces resulting from compression of portions of the gasket.

4,377,056

DOOR EDGE GUARD LINER AND LINER ASSEMBLY

Robert Adell, Novi, Mich., assignor to U.S. Product Development Company, Novi, Mich.

Filed Oct. 7, 1980, Ser. No. 194,749
Int. Cl.³ B60J 5/00
U.S. Cl. 49—462 3 Claims



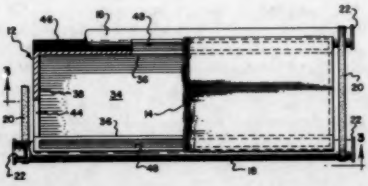
1. An improved edge guard and liner for a metal door edge guard of U-shaped cross-section, the liner being of the type comprised of a nonmetallic material intended to prevent metal-to-metal contact between the metal door edge guard and the sheet metal edge of a door received within the edge guard and the liner, the liner being adapted to be positioned between the edge guard and the door edge and being characterized by at least one bead extending along its length and a membrane connected to the bead, and in combination with a metal edge guard of U-shaped cross-section, the liner being within the edge guard and the bead being in contact with the interior surface of the edge guard, and with a sheet metal edge of a door received within the U-shaped liner, the membrane of the liner occupying less than the entire space between the interior surface of the edge guard and the door edge in the region adjacent the bead.

4,377,057

HAND CABBING APPARATUS

Philip J. Pincha, Seattle, Wash., assignor to Lortone, Inc., Seattle, Wash.

Division of Ser. No. 915,477, Jun. 14, 1978, abandoned. This application May 12, 1980, Ser. No. 149,024
Int. Cl.³ B24D 17/00
U.S. Cl. 51—359 2 Claims



1. Cabbing apparatus comprising:

an elongated frame providing a pair of longudinal side walls and a bottom wall therebetween, said bottom wall having a convex exterior surface interrupted by grit collection groove and an inner surface, said grooves extending longitudinally of the frame,

an abrasive sheet,

retaining means opposing the outside of said side walls for holding said abrasive sheet in working position gripped between the retaining means and the side walls and spaced above the inner surface of the bottom wall or engaging the convex exterior surface thereof, said retaining means including a pair of longitudinal side rails holding side edge portions of said sheet against said side walls and a pair of elastic bands stretched around said side rails near the ends thereof to hold the side rails in position, and

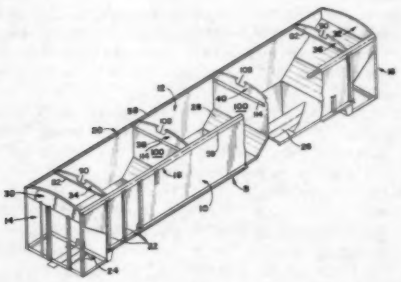
end walls on the frame connecting the side walls and having a curved, concave upper wall to define the concavity for dishing the abrasive sheet downwardly when it is held spaced above the inner surface of the bottom wall.

4,377,058

CURVED HOPPER CAR ROOF

Keith J. Hallam, Marietta, and Walter J. Marulic, Smyrna, both of Ga., assignors to United American Car Co., Atlanta, Ga.

Filed Sep. 9, 1980, Ser. No. 185,497
Int. Cl.³ B61D *7/00, 17/16, 39/00*
U.S. Cl. 52—45 **22 Claims**



1. A curved roof construction for a hopper type rail car having opposed elongated side walls and opposed end walls with a car centerline extending between said end walls intermediate said side walls, said roof construction comprising: roof support webs spaced inwardly from said end walls and extending between upper portions of said side walls, said support webs having upwardly curved roof panel support surfaces, roof side panels positioned on opposite sides of said car centerline and having inner edges spaced-apart from one another on opposite sides of said car centerline to define a hatch opening, said side panels extending along said side walls between said support webs, a single roof end panel spanning said side walls and extending between each said support web and an adjacent upper portion of an end wall, and each said end panel having an inner edge adjacent an associated support web with a relieved area therein extending toward the adjacent end wall and aligned with said hatch opening to define hatch opening end portions said roof side panels and said roof end panels supported by said curved roof support surfaces.

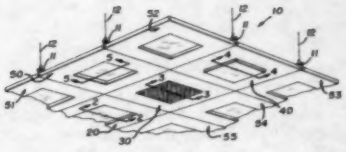
11. A roof construction for rail cars and the like comprising: roof side panels positioned on opposite sides of a longitudinal centerline and having inner edges spaced-apart from one another on opposite sides of said centerline to define a hatch opening, said side panels having outer edges between which a predetermined width is defined, roof end panels positioned at opposite ends of said side panels, each said end panel having a width substantially the same as said predetermined width, said side and end panels having adjacent edges, support webs extending substantially perpendicular to said centerline beneath said adjacent edges and having upper support surfaces to which said adjacent edges are secured, and said end panels having relieved areas extending inwardly from said adjacent edges thereof to a point generally intermediate said end panels in a direction away from said side panels and aligned with said hatch opening to define hatch opening end portions.

4,377,059

CONCEALED CEILING SYSTEM WITH ACCESSIBLE CEILING PANELS

Albert F. Kuhr, Elk Grove Village, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Continuation of Ser. No. 943,882, Sep. 18, 1978, abandoned. This application Aug. 11, 1980, Ser. No. 176,733
Int. Cl.³ E04B *1/00*
U.S. Cl. 52—98 **11 Claims**



1. A suspended ceiling system comprising:

a plurality of inverted-T runners concealed within said system;

kerfed edge ceiling tiles supported at said kerfed edges by said inverted-T runners, adjacent said tiles being in proximate contact along the lower edge surfaces thereof distal said inverted-T runners concealing said inverted-T runners from view below, wherein;

at least one said ceiling tile in said system comprises a central portion coplanar with the remainder of said tile and optionally vertically demountable and separable from the remainder of said tile along a cut defining said central portion through said tile perpendicular to the upper and lower surfaces thereof, said cut having a width no greater than 0.020 inches and further defining upon optional removal of said central portion a central opening within said ceiling tile wherein said central portion is recessed upwardly of the lower surface of said tile.

4,377,060

WALL CONSTRUCTION

Douglas Ragland, P.O. Box 55527, Houston, Tex. 77055

Continuation of Ser. No. 933,744, Aug. 15, 1978, abandoned. This application Aug. 25, 1980, Ser. No. 180,833
Int. Cl.³ E04B *1/38*
U.S. Cl. 52—489 **14 Claims**

1. A fastening clip for securing a panel having a side edge to a support member comprising:

a base portion having a front side, a back side, a first edge, a second edge, a third edge and a fourth edge,

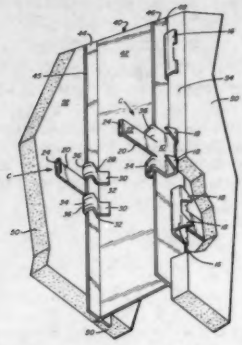
a leg portion depending from said first edge in a direction generally outwardly from said first side, said leg portion including retaining means to secure said clip to said side edge of said panel,

an elongate tongue portion extending generally laterally outwardly and generally centrally from said second edge of said base portion, said tongue portion being narrower in width than said base portion between said third and fourth edges and having a guide surface formed by an extension of said front side,

first and second gripping fingers disposed adjacent said back side of said base portion, said tongue portion and said gripping fingers extending in generally opposite directions from one another, and

first and second means interconnecting said first and second

gripping fingers, respectively, to said second edge, said first and second means being connected to said second edge on opposite sides of said tongue portion, said gripping fingers being resiliently movable away from said back side whereby said support member may be gripped between said back side of said base member and said gripping fingers.



4,377,061

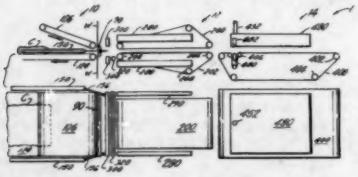
HORIZONTAL PACKAGING APPARATUS

Jan C. H. Olson, Braemhult, and Karl G. Carlson, Vaestra Froelunda, both of Sweden, assignors to TEX Innovation AB, Vaestra Froelunda, Sweden

Continuation-in-part of Ser. No. 937,383, Aug. 28, 1978, abandoned. This application Oct. 16, 1980, Ser. No. 197,405

Int. Cl.³ B65B *31/02, 63/02, 9/02*

U.S. Cl. 53—433 **15 Claims**



1. An apparatus for wrapping a commodity comprising, in combination, means for supplying a pair of spaced apart layers of air-impermeable wrapping material each having a free lateral edge and for placing said pair of layers of wrapping material in registry, said layers of wrapping material being secured together along a leading edge to form an open-sided partial envelope having a closed leading portion, means for advancing a commodity along a path into engagement with said wrapping material between said layers of wrapping material, means for sealing the free lateral edges of said layers of wrapping material together to form an envelope having at least one closed lateral side and a closed leading portion with said commodity therein, means for perforating said opposed lengths of wrapping material across the width thereof to form a container length, and means for sealing the balance of said pair of layers of wrapping material of the envelope to form a wrapped commodity enclosed in a wrapper.

4,377,062

SNAPPER HEAD FOR HARVESTING MAIZE

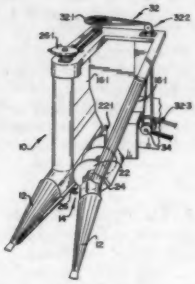
Dugmore D. Slattery, P.O. Box 777, Potgietersrus, South Africa

Filed Jul. 1, 1981, Ser. No. 279,565

Claims priority, application South Africa, Jul. 22, 1980, 80/4418

Int. Cl.³ A01D *45/02*

U.S. Cl. 56—14.3 **8 Claims**



1. A snapper head for harvesting maize, said snapper head having:

snapper means defining a slot into which plants to be harvested can pass, said snapper means comprising a snapper plate and a snapper shoulder above the level of the snapper plate and on the opposite side of the slot to the snapper plate,

means for drawing stalks of the plants downwardly through the slot while said snapper means inhibits passage of crop through the slot, enabling the crop to be separated from the stalks by the snapper means, and

means for gathering the stalks into and along the slot, said means comprising a conveyor screw rotatable about an axis at the same side of the slot as the snapper plate and extending over the slot and above the snapper shoulder for guiding stalks along the slot and for conveying the crop separated from the stalks away from said slot.

4,377,063

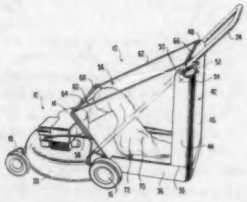
DISPOSABLE GRASS CATCHER

John L. Leaphart, 709 Creekside Dr., Mount Pleasant, S.C. 29464

Filed Oct. 29, 1980, Ser. No. 201,810

Int. Cl.³ A01D *53/06*

U.S. Cl. 56—202 **21 Claims**



1. A grass clipping catcher for use with a lawn mower having a grass discharge chute, comprising:

a non-self supporting perforated bag for attachment to said discharge chute;

a base pan for supporting said bag and adapted to be connected to said mower;

a shield hingedly attached to said base pan for movement between an upright position and a horizontal position; and

a hood removably disposed over said base pan, said hood being disposed in abutting relation to said base pan and said shield.

4,377,064

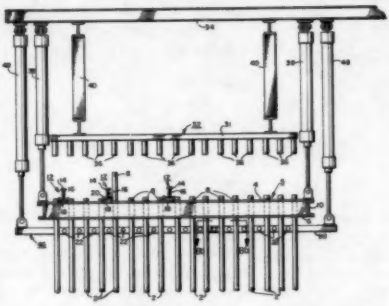
ROD PRESS FRUIT HARVESTER

Donald L. Peterson, Martinsburg, W. Va., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 18, 1981, Ser. No. 322,332

Int. Cl.³ A01D *46/20*

U.S. Cl. 56—328 R **14 Claims**



13. A rod press fruit harvesting apparatus, comprising:

(a) a frame supported by a boom assembly pivotally attached to a mobile means;

(b) a rod press fruit removal mechanism movably joined to the frame by hydraulically operated cylinder, said fruit removal mechanism having a plurality of fruit-removing rods and a pair of frame members for removably holding and supporting said rods, said frame members being generally parallel to each other, said fruit-removing rods being rigid and having longitudinal axes and substantially circular cross-sections and being equally spaced in a triangular pattern in the frame members;

(c) a plurality of spring tensioned rod hold-down and release mechanisms mounted on the fruit removal mechanism, each of said rod hold-down and release, mechanisms being disposed to exert a force against two of the fruit-removing rods and each of said rod hold-down and release, mechanisms being comprised of a tensioning bolt, a compression spring, a forced transmission block, a force bearing surface and a pair of rod hold-down and release tabs, each of said tabs being pivotally mounted on the forced transmission block and said tabs and forced transmission block being subjected to a predetermined force applied through said force bearing surface by the tensioning bolt and compression spring;

(d) a retraction assist mechanism comprised of at least one rod removably attached to a suitable support, said also retraction assist, mechanism being disposed so that the rod is below and parallel to the frame members, said retraction assist, mechanism being movably joined to the frame by hydraulically operated cylinder, said hydraulically operated cylinder being adapted to lower the retraction assist, mechanism at the same time and at the same rate of movement as the rod press fruit removal retraction assist, mechanism is lowered and to delay retraction of the mechanism until the fruit removal mechanism is retracted; and

(e) a fruit-removing rod repositioning mechanism disposed above and generally parallel to the frame members of the aforesaid fruit removal mechanism, said rod repositioning mechanism having a flat plate with a plurality of studs on its lower surface, said studs being spaced equally in the same triangular pattern as the aforesaid fruit removing rods so that each stud is positioned directly above one of the rods, said rod repositioning mechanism being joined to the frame.

4,377,065

DOUBLE TWISTER

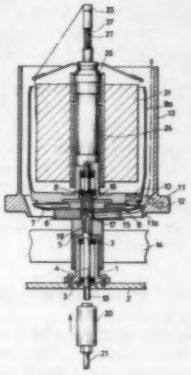
Hideo Yanobu, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Jun. 24, 1981, Ser. No. 276,832

Claims priority, application Japan, Jun. 26, 1980, 55/87629

Int. Cl.³ D01H *13/10, 7/86, 15/00*

U.S. Cl. 57—279 **5 Claims**



1. A double twister provided with a pneumatic yarn guide means and tension regulating means, said double twister comprising

a supply bobbin having a central hole;

a hollow yarn guide tube inserted vertically and slidably in said central hole of said yarn supply bobbin;

a cylindrical bobbin supporting member with a flange for supporting a bobbin, said member being pin connected to said yarn guide tube so that said yarn guide tube and said bobbin supporting member are integrally moved in a vertical direction;

a first spring for urging upward said yarn guide tube and said bobbin supporting member;

a brake disc;

a flyer boss supporting member mounted freely rotatable at the top end of said bobbin supporting member through said brake disc and through which said yarn guide tube is inserted; and

a second spring spirally wound on the upper end portion of said yarn guide tube thereby to bring said flyer boss supporting member into pressing contact with said brake disc when said yarn guide tube is located at a lower position.

4,377,066

POLLUTION-FREE PRESSURIZED FLUIDIZED BED COMBUSTION UTILIZING A HIGH CONCENTRATION OF WATER VAPOR

Norman L. Dickinson, Box 211, Lavallette, N.J. 08735

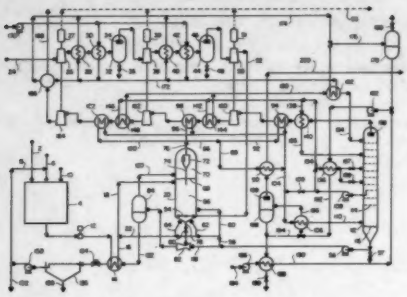
Filed May 27, 1980, Ser. No. 153,440

Int. Cl.³ F02C *3/26*

U.S. Cl. 60—39.05 **16 Claims**

1. A continuous pressurized fluidized bed combustion process comprising charging an aqueous slurry of solid fuel particles and alkali in an amount at least the chemical equivalent of the sulfur content of the fuel as alkali sulfate, to a combustion zone comprising a bed of solid particles; fluidizing the bed with an upward velocity between 1 and 10 feet per second of a gas

containing oxygen and at least 3 atmospheres partial pressure of water vapor measured at the outlet of the zone; maintaining the combustion zone at a temperature between 710 and 1600 degrees Fahrenheit; withdrawing gaseous products containing



entrained solid matter from above the zone; cooling the gaseous products below their dewpoint at essentially combustion pressure by the indirect transfer of useful heat; and separating from uncondensed gaseous products an aqueous condensate carrying essentially all of the entrained solid matter.

4,377,067

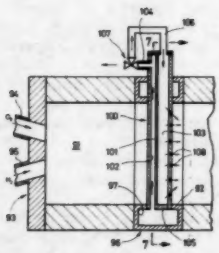
STEAM GENERATOR

Hans J. Sternfeld, Friedrichsruhe; Josef Reinkenhof, Heilbronn, and Heinrich Lambrecht, Neuenstadt, all of Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt, Bonn, Fed. Rep. of Germany

Filed Nov. 24, 1980, Ser. No. 209,687

Int. Cl.³ F02C *7/00*

U.S. Cl. 60—39.55 **7 Claims**



1. A steam generator, comprising

(a) means defining a combustion chamber having a longitudinal axis;

(b) an injection head for introducing gaseous hydrogen and gaseous oxygen into one end of said combustion chamber;

(c) tubing means extending within said chamber in a plane substantially perpendicular to the longitudinal axis thereof;

(d) means longitudinally partitioning said tubing means into a first compartment adjacent said injection head and a second compartment remote from said injection head;

(e) means for supplying water to the first compartment, and means for discharging water from the first compartment so that water is conducted through the first compartment in order to cool the tubing; and

(f) means for supplying water to the second compartment, said second compartment having a wall portion containing apertures for injecting water into the combustion chamber away from the injection head.

4,377,068

STATOR FOR A HYDRODYNAMIC TORQUE CONVERTER

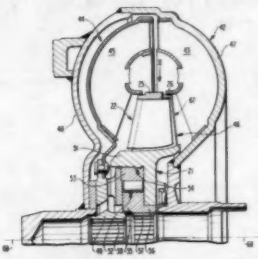
Andreas Braatz, Rutesheim, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Feb. 15, 1980, Ser. No. 122,074

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1979, 2905738

Int. Cl.³ F16H *41/04*

U.S. Cl. 60—342 **34 Claims**



1. A stator construction for a hydrodynamic torque converter, the stator construction including a plurality of spaced stator blades fixedly arranged on a supporting hub, and means for non-rotatably fixing the supporting hub in position in a reactionary direction of rotation of the torque converter, characterized in that at least one further stator blade is arranged between two adjacent fixed stator blades, means are provided for movably guiding the at least one further stator blade on the supporting hub for movement along a path of revolution concentric to a pump wheel axis of the hydrodynamic torque converter between a central partial load position and a clutch position in proximity to one of the adjacent fixed stator blades lying rearwardly as viewed in the reactionary direction of rotation, the at least further stator blade includes a blade hollow facing in a direction opposite the reactionary direction of rotation, each of the fixed stator blades includes a blade crest, the blade hollow of the at least one further stator blade is configured so as to accommodate the blade crest of the adjacent fixed stator blade lying rearwardly as viewed in the reactionary direction of rotation so as to enable the blade surfaces of the at least one further stator blade to engage blade surfaces of the last-mentioned fixed stator blade along an entire length thereof such that the at least one further stator blade and the last-mentioned fixed stator blade function as a stop and counter-stop defining the clutch position and change a pitch of the stator blades, and in that stop means are provided for fixing the at least one further stator blade in the central partial load position.

4,377,069

BRAKE BOOSTER

Hideyuki Kobayashi, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 19, 1981, Ser. No. 236,102

Claims priority, application Japan, Feb. 27, 1980, 55-24550

Int. Cl.³ B60T *13/00*

U.S. Cl. 60—547.1 **5 Claims**

1. A brake booster assembly of a vehicle having a dash board and a brake pedal comprising:

a housing;

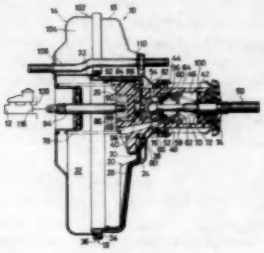
a brake master cylinder connected to the housing;

a diaphragm power piston positioned in said housing and dividing the housing into first and second fluid chambers and having a retracted position defined by abutment with the housing;

a control valve mechanism for the diaphragm power piston

for controlling a pressure differential between the chambers in response to movement of said brake pedal axially relative to the power piston; and

at least two bolt members which extend from the master cylinder bypassing outside of the housing to said dash board of said vehicle for installation such that a brake reactional force is transmitted from the master cylinder to the dash board bypassing the housing wherein the housing



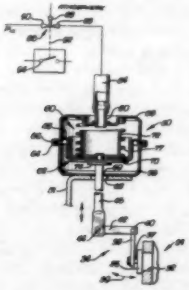
is contoured so as to have a pair of recessed portions located symmetrically with respect to the center of the housing and the two bolt members pass through the recessed portions from the master cylinder to the dash board with both ends in thread and nut connection with the master cylinder and the dash board, respectively, whereby the housing is clamped between the master cylinder and the dash board.

4,377,070

TURBOCHARGER CONTROL ACTUATOR

Alan P. Shadbourne, Torrance, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Jun. 13, 1980, Ser. No. 159,191
Int. Cl.³ F02B 37/12
U.S. Cl. 60—602 **24 Claims**



1. In a turbocharged engine system having an engine, a turbine driven by engine exhaust gases, a compressor driven by the turbine to draw in air for supply to the engine, means forming a bypass flow path for bypass passage of exhaust gases around the turbine, and a waste gate valve for opening and closing the bypass flow path, a turbocharger control actuator, comprising:

an actuator housing;

a flexible diaphragm mounted with said housing and cooperating therewith to define a pressure chamber;

an actuator rod having one end for connection to the waste gate valve to control the position thereof, and its other end movably carried with said diaphragm;

spring means for urging said actuator rod to retain the waste gate valve in a position closing the bypass flow path; and

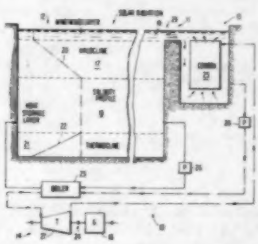
means for supplying a first control pressure to said pressure chamber at part load engine operating conditions, said first control pressure having a magnitude for causing movement of said diaphragm to displace said actuator rod for moving the waste gate valve against said spring means to a position opening the bypass flow path, said supplying means further including switch means for substantially disconnecting said first control pressure from said pressure chamber at substantially full load engine operating conditions and for supplying a second control pressure to said pressure chamber, said second control pressure having a magnitude for causing movement of said diaphragm to displace said actuator rod for moving the waste gate valve to a position closing the bypass flow path, said switch means coupling said pressure chamber to the intake of the compressor during part load engine operating conditions, and coupling said pressure chamber to ambient pressure at substantially full load engine operating conditions.

4,377,071

SOLAR ENERGY POWER STATION

Gad Assaf, and Lucien Y. Bronicki, both of Rehovot, Israel, assignors to Solmat Systems, Ltd., Yavne, Israel

Filed Aug. 4, 1980, Ser. No. 174,843
Int. Cl.³ F03G 7/02
U.S. Cl. 60—641.8 **21 Claims**



1. In a solar energy power station of the type having a solar pond with a halocline interposed between a lower heat storage layer and an upper wind-mixed layer at the surface of the pond exposed to an ambient environment, and a power plant having a boiler responsive to water from the heat storage layer for vaporizing a working fluid, a prime mover for producing work by extracting heat from the vaporized working fluid, and a condenser for condensing the working fluid exhausted from the prime mover before returning the condensate to the boiler, the method comprising:

(a) providing an auxiliary cooling pond containing water of the same salinity as but cooler than the wind-mixed layer;

(b) cooling the condenser with water from the cooling pond; and

(c) exchanging water between the auxiliary pond and the wind-mixed layer.

4,377,072

CERAMIC HEAT EXCHANGE MODULE AND APPARATUS AND PROCESS UTILIZING SAME

John Campbell, Jr., Woodland Hills; Larry H. Russell, Agoura, and Philip I. Robinson, Calabasas, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 27, 1980, Ser. No. 200,635
Int. Cl.³ F01K 25/00
U.S. Cl. 60—682 **20 Claims**

1. A fluidized bed combustor comprising:

an insulated chamber having a base;

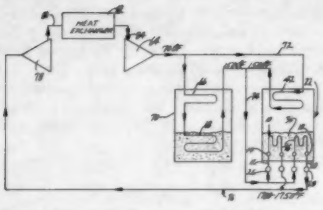
a fluidized bed contained by said insulated chamber and comprising a lower, stratified zone of compliant, stagnant material and an upper, stratified zone of combusting, carbonaceous material;

means external to said insulated chamber for delivering a flow of fluid to be heated by said fluidized bed;

means external to said insulated chamber for receiving said flow of fluid after having been heated by said fluidized bed; and

a heat exchange module comprising:

a first ceramic inlet manifold situated within said lower stratified zone,



a second ceramic outlet manifold situated within said lower stratified zone,

a plurality of ceramic heat exchange conduits, each ceramic heat exchange conduit coupling said ceramic inlet manifold to said ceramic outlet manifold in open flow communication and extending vertically upwards from said manifolds into said upper stratified zone,

a ceramic inlet conduit extending through said insulated chamber and flowingly connecting said ceramic inlet manifold to said external flow delivering means, and

a ceramic outlet conduit extending through said insulated chamber and flowingly connecting said ceramic outlet manifold to said external flow receiving means.

4,377,073

METHODS FOR CONVERTING HEAT INTO MECHANICAL ENERGY AND/OR USEFUL HEAT

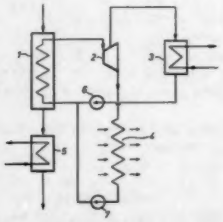
Anton Pocrnja, Munich, and Martin Streich, Starnberg, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 17, 1981, Ser. No. 255,172

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1980, 3015307

Int. Cl.³ F28B 7/00

U.S. Cl. 60—693 **4 Claims**



1. A method of utilizing the heat content of a heated carrier agent in response to variations in predetermined atmospheric temperatures comprising indirectly contacting said heated carrier agent with a working fluid having a boiling point lower than that of water, said working fluid being maintained at a predetermined elevated working fluid pressure, thereby vaporizing said working fluid, producing mechanical energy by expanding said working fluid to first and second reduced pressures, said first reduced pressure comprising the condensation pressure of said working fluid corresponding to said predetermined atmospheric temperature, and said second reduced pressure comprising an intermediate pressure between said predetermined elevated working fluid pressure and said condensation pressure, separating said working fluids into first and second working fluid streams comprising said working fluids expanded to said first and second reduced pressures, respectively, condensing said first working fluid stream by indirect contact with the atmosphere at said predetermined atmospheric temperature, condensing said second working fluid stream by indirect contact with a liquid heat carrier so as to produce useful heat therefrom, and pressurizing said first and second working fluid streams to said predetermined elevated working fluid pressure.

4,377,074

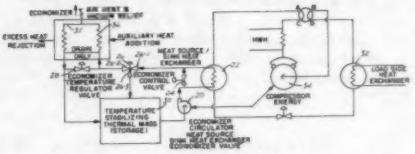
ECONOMIZER REFRIGERATION CYCLE SPACE HEATING AND COOLING SYSTEM AND PROCESS

Douglas M. Jardine, Colorado Springs, Colo., assignor to Kaman Sciences Corporation, Colorado Springs, Colo.

Filed Jun. 29, 1981, Ser. No. 278,849

Int. Cl.³ F25B 39/04

U.S. Cl. 62—183 **4 Claims**



1. An economizer refrigeration cycle space heating/cooling system and process heating system which comprises:

a compressor means,

a load side heat exchanger and a heat source/sink heat exchanger connected thereto,

an economizer circulator, an economizer control valve, an excess heat rejection economizer and a temperature stabilizing thermal mass storage filled with a coolant all connected in series with the heat source/sink heat exchanger which is disposed above the thermal mass storage to permit the coolant to be diverted by the economizer valve to flow from the heat source/sink heat exchanger through the excess heat rejection heat exchanger to the temperature stabilizing thermal mass storage and back to the suction side of the economizer circulator or selectively with the coolant bypassing the heat source/sink heat exchanger to the temperature stabilizing thermal mass storage, said temperature stabilizing thermal mass storage having a thermal capacitance greater than the sensible heat of the contained coolant at operating temperatures below ambient atmosphere temperature with the economizer circulator being operated to maintain the refrigeration cycle condensing temperature above the evaporating temperature, said heat source/sink heat exchanger economizer valve being adapted to maintain a substantially constant condensing temperature as the evaporating temperature or load changes and adapted to bypass the heat source/sink heat exchanger to permit reduction of the amount of heat in the thermal mass storage during times of refrigeration cycle in operation; and,

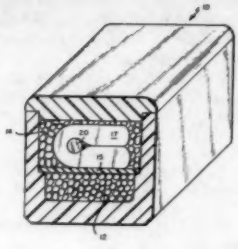
an economizer temperature regulator valve adapted to control the amount of heat rejected from the excess heat rejection economizer by regulating the amount of coolant directed to the economizer.

4,377,075

REFRIGERANT AND METHOD FOR SHIPPING PERISHABLE MATERIALS

Michael S. Russo, Brockton, Mass., assignor to New England Nuclear Corporation, Boston, Mass.

Filed Mar. 9, 1981, Ser. No. 241,476
Int. Cl.³ F25D 3/08
U.S. Cl. 62—372 4 Claims



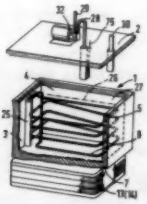
1. A method for shipping a degradable product, said method comprising: placing a predetermined quantity of dry ice in the bottom of an insulated container; sandwiching said product in a predetermined quantity of refrigerant gel, placing the refrigerant gel and sandwiched product on top of the dry ice in such a manner that the dry ice does not contact the product, and sealing the insulated container to provide a self-contained refrigerated environment for the product that will not have a temperature lower than about −20° C. or higher than about 0° C. for 48 hours or more.

4,377,076

COOLING ARRANGEMENT, PARTICULARLY FOR BEVERAGES

Wilhelm Staudt, Mosbach, and Hans-Wido Steier, Esting, both of Fed. Rep. of Germany, assignors to Electrolux-Sigmund GmbH, Mosbach, Fed. Rep. of Germany

Filed Feb. 27, 1981, Ser. No. 238,676
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3048967
Int. Cl.³ B65D 5/62
U.S. Cl. 62—395 2 Claims



1. In a cooling device for fluids, particularly beverages, the combination comprising:
(a) a vessel for accommodating a body of fluid, said vessel having an upper portion and a lower portion;
(b) fluid inlet and outlet means for admitting fluid into and withdrawing fluid from said vessel;
(c) a thermally insulating jacket closely surrounding said vessel;
(d) cooling means for said vessel intermediate the latter and said jacket and overlapping a substantial part of the surface area of said vessel, said cooling means having an upper cooling section which contacts said upper portion and a lower cooling section which contacts said lower portion, and said cooling means having an inlet and an outlet and being arranged for flow of a cooling fluid therethrough from said inlet to said outlet; and
(e) supply means for passing a cooling fluid through said cooling means, said supply means comprising:
(1) a base;
(2) a thermally insulated water container supported by said base; and
(3) a refrigeration system, the prominent parts of which are contained within said base, said refrigeration system including an evaporator located within and in heat exchanging relationship with the interior of the container, first conduit means including pump means connecting the water container with the inlet and the outlet, and second conduit means connecting the prominent parts of the refrigeration system with the evaporator, said second conduit means having portions which extend through a wall of said container to a height exceeding the maximum permissible filling level of the latter and further comprising a pipe which surrounds said conduit portions, said pipe being substantially watertight in said container and extending through said wall in substantially watertight relationship.

4,377,077

DEVICE AND METHOD FOR CONTROLLED FREEZING OF CELL CULTURES

David J. Granlund, Rockville, Md., assignor to Biotech Research Laboratories, Inc., Rockville, Md.

Filed Jul. 15, 1981, Ser. No. 283,634
Int. Cl.³ F25D 3/08
U.S. Cl. 62—457 15 Claims

1. A device for controlled freezing of cell cultures contained in a portion of one or more cell culture vials which comprises:
(a) a container having a removable lid and a bottom;
(b) grid means for independently supporting each cell culture vial in a substantially upright position in said container;
(c) a volume of liquid refrigerant in said container sufficient to completely submerse said portion of each vial containing cell culture in said refrigerant, said volume of refrigerant being in excess of fifteen times the total volume of cell culture contained in said one or more vials; and
(d) suspension means resting on the bottom of said container to suspend said grid means and said one or more vials above the bottom of said container.

4,377,078

CHAIN AND END ATTACHMENT MEANS

Alvin Block, Bedford, N.Y., assignor to Intimate Jewels, Inc., Katonah, N.Y.

Filed Aug. 4, 1981, Ser. No. 291,221
Int. Cl.³ A44C 11/02
U.S. Cl. 63—2 7 Claims

1. A safety chain keeper for detachably attaching the two

ends of a leugth of flexible linear solid chain to each other which comprises a substantially spherical member, said spherical member being permanently mounted to one end of said chain length, a deformable clamp, one end of said clamp being mounted to the other end of said chain length, the other free end of said clamp having two discrete and spaced apart end portions, the middle portion of said clamp between said one clamp end and said other free clamp end being of substantially circular shape and comprising two curved arms, and a frusto-conical keeper element, said keeper element being freely mounted about said chain length adjacent said clamp, said keeper element tapering and converging away from said clamp to a terminal diameter at one end less than the diameter of said spherical member plus the thickness of the two arms of the middle portion of said clamp, the other end of said keeper element having a diameter greater than the diameter of said

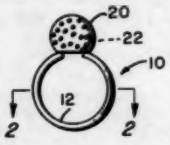
spherical member plus the thickness of the two arms of the middle portion of said clamp, said two arms of the middle portion of said clamp being resiliently biased away from each other, so that when said spherical member is inserted into said clamp between said two arms, said clamp is adapted to deform and said two arms to detachably engage said spherical member, and so that when said clamp with engaged spherical member is displaced into said keeper element, by concomitantly pulling said keeper element and said other end of said chain length away from each other, the clamp and engaged spherical member are tightly fitted and wedged into said keeper element, the outer surface of each curved arm of the middle portion of said clamp engaging the inner surface of said keeper element, so that the two ends of the length of flexible linear solid chain are detachably attached to each other and cannot be separated from each other except by pulling the one end of said chain length away from said keeper element.

4,377,079

RING GUARD

Peter L. Krueger, 301 W. Sylvania Ave., Neptune City, N.J. 07712

Filed Jul. 23, 1980, Ser. No. 171,948
Int. Cl.³ A44C 9/00
U.S. Cl. 63—15.8 **3 Claims**



1. For a finger-ring having (a) an annular portion with (1) an outer diametrical surface, (2) an inner diametrical surface, and (3) substantially parallel side surfaces joining said diametrical surfaces, and (b) a gem stone, or the like, coupled to said annular portion, a ring guard, comprising:

first means for nestably receiving therein substantially all of the annular portion of a finger-ring, and for occluding from view the outer diametrical surface, and the parallel side surfaces of such finger-ring; and

second means replaceably coupled to said first means for wholly enveloping, and occluding from view, a gem stone or the like coupled to said annular portion of such finger-ring; wherein

said first means comprising a substantially circular element having a transverse separation formed therein, and a pair of confronting, semi-circular components fixed to said element, with one of said components fixed at one side of said separation, and the other of said components fixed at the opposite side of said separation, and a circlet replaceably and surroundingly engaging said components;

said second means comprising a hollow shield having one opening formed therein; and

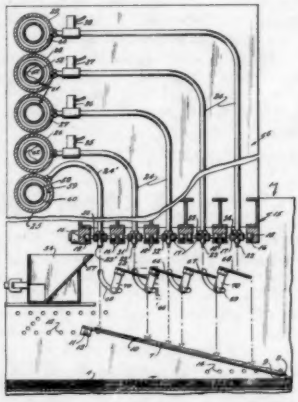
said shield being replaceably and surroundingly engaged with said circlet, said opening of said shield circumscribing said circlet.

4,377,080

APPARATUS FOR OBTAINING VARIEGATED PATTERNS

Gary R. Fox, Dalton, Ga., assignor to Greenwood Corp. of America, Dalton, Ga.

Continuation-in-part of Ser. No. 179,752, Aug. 20, 1980, abandoned. This application Aug. 24, 1981, Ser. No. 295,818
Int. Cl.³ D06B 1/06
U.S. Cl. 68—205 R **8 Claims**



1. Apparatus for producing diffused variegated patterns in pile fabrics comprising:

(a) an applicator member having

(i) an applicator edge positionable parallel to and across a width of moving length of fabric, and

(ii) a smooth upper surface inclined toward said applicator edge;

(b) means for delivering a first coating material onto said smooth upper surface to form a continuous sheet thereof flowing by gravity toward said applicator edge;

(c) a distribution means including

(i) at least one array of nozzles positioned for delivery of at least one additional coating material onto the continuous sheet upstream of said applicator edge, said array of nozzles including at least one row of nozzles aligned transversely of the path of travel of the fabric,

(ii) an elongate distributor member having a plurality of apertures therein,

(iii) a plurality of conduits in individual communication between one of said distributor apertures and one of said nozzles, said conduits each including a flexible duct and a valve and

(iv) delivery means for selectively delivering said additional coating material through selected nozzles of said

array of nozzles to interdisperse with the continuous sheet of the first coating material while upon said smooth upper surface; and

(d) a supporting bed for supporting a length of fabric in a substantially horizontal position to permit the length of fabric to move in a downstream direction and to permit the first and additional coating materials to penetrate into the fabric by force of gravity when the fabric is on the supporting bed.

4,377,081

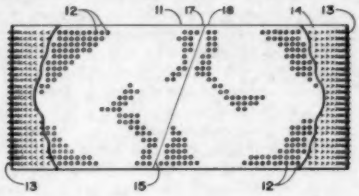
BELT SURFACING TOOL

Joseph D. Konrad, 6340 Stumph Rd., Cleveland, Ohio 44130

Filed Oct. 9, 1980, Ser. No. 195,393

Int. Cl.³ C14B *1/44*

U.S. Cl. 69—6.5 **9 Claims**



1. A surfacing tool comprising an endless belt consisting of a sheet having holes therein and burrs projecting therefrom, said burrs all projecting from one side of said belt, the total area of said holes being not greater than about one-half of the total surface area of said belt.

4,377,082

CYLINDER-LOCK WITH FLAT KEY

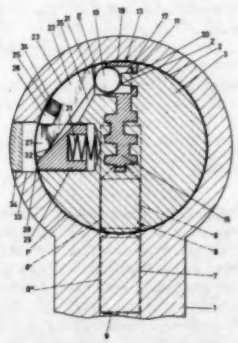
Heinz Wolter, Kürten, Fed. Rep. of Germany, assignor to DOM-Sicherheitstechnik GmbH & Co. KG, Brühl, Fed. Rep. of Germany

Filed Nov. 14, 1980, Ser. No. 206,924

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1979, 2947402

Int. Cl.³ E05B *19/08, 19/12, 27/10*

U.S. Cl. 70—364 A **10 Claims**



1. For a cylinder lock a flat key comprising a shank having at least one profile longitudinal groove extending from an end thereof to accommodate a rib in a key channel in a cylinder core of the cylinder lock, said shank including fixed key bits adapted to index tumbler pins in the cylinder lock, said flat key in an area of the wide side of the shank including an additional key bit formed from a movable member, said movable, additional key bit being adapted to be controlled by a shoulder in the key channel such that when the key is inserted said additional key bit moves an auxiliary tumbler into a position which allows the cylinder core of the lock to be rotated, the improvement wherein

the shank is formed with a transverse opening in a lateral wall of said profile longitudinal groove,

said additional key bit comprises a rolling element movably retained within said transverse opening in said shank,

said rolling element has a diameter which is greater than the thickness of the material of the shank in the vicinity of said opening such that said rolling element at all times projects laterally beyond said opening on at least one side of the key.

4,377,083

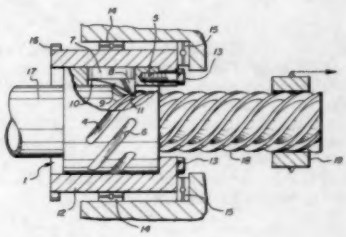
TUBE CORRUGATING APPARATUS AND METHOD

Dale H. Shepherd, 620 Hewitt Rd., Hewitt, Tex. 76643, and Lothar R. Zifferer, P.O. Box 8799, Waco, Tex. 76710

Filed Sep. 18, 1979, Ser. No. 76,736

Int. Cl.³ B21D *15/04*

U.S. Cl. 72—68 **12 Claims**



1. A metal tube corrugating die operable to corrugate tubing without a supporting mandrel comprising

a hollow die body having a longitudinally extending bore therethrough,

a plurality of die teeth supported in said die body equidistantly around the circumference of and extending into said bore,

each of said die teeth having a straight supporting base portion supported in said die body at an angle to the longitudinal axis thereof, and

a corrugating die portion comprising a flat planar plate extending from said base portion radially inward of said bore and having an edge curving inward from a root portion adjacent to the surface of said bore to a peak portion radially inward therefrom and having an arcuate length of a small fraction of one helical coil of the tubing corrugated therein, the angle and spacing of said die teeth being such that multiple uniform helical corrugations in thin walled tubing are produced by passing such tubing therethrough while rotating said die.

4,377,084

PRESS APPARATUS HAVING RESILIENT STOP BLOCKS

Elton G. Kaminski, Sidney, Ohio, assignor to The Stolle Corporation, Sidney, Ohio

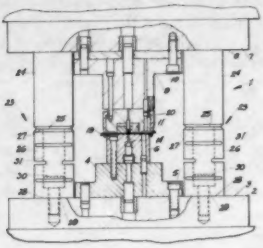
Filed Dec. 29, 1980, Ser. No. 220,511

Int. Cl.³ B21D *28/10, 28/18*

U.S. Cl. 72—325 **12 Claims**

1. In a press of the type having a stationary press bed including a lower tool holder mounting a scoring die and a vertically movable press ram overlying said bed including an upper tool holder mounting a scoring punch for scoring a sheet of stock material to form an easy open can end having a residual, the improvement in combination therewith comprising resilient stop means fixedly secured to said press bed and extending

toward said ram for controlling the closed position of the tooling including at least one resilient stop block formed by a block-like member having a longitudinal axis extending substantially perpendicular to said bed and ram and a plurality of longitudinally spaced angularly aligned slots extending inwardly through the sides of said block and oriented transversely to the longitudinal axis of said block, and at least one solid metallic stop block fixedly secured to said press ram and



extending toward said bed in axial alignment with said resilient stop block, each of said blocks having substantially flat faces formed on their outer ends, said blocks being positioned such that said faces make contact as said tooling approaches the closed position, said resilient and solid stop blocks forming a resilient-solid block pair, said resilient stop block being compressable as said bed and ram aproach each other to gradually preload the press and being positioned and configured to accurately control the thickness of the residual.

4,377,085

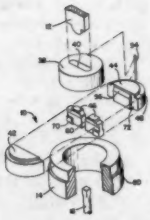
FEMALE DIES AND METHOD OF MANUFACTURE

Richard P. McDermott, Troy, and Ernest J. Brown, Birmingham, both of Mich., assignors to W-F Industries, Inc., Centerline, Mich.

Filed Apr. 16, 1980, Ser. No. 140,843

Int. Cl.³ B21D *37/12, 37/14;* **B21K** *5/00*

U.S. Cl. 72—359 **24 Claims**



1. A segmented female die forming part of a closed die set, said closed die set being shaped to operate upon a billet of predetermined size and volume so that the part produced from said billet substantially entirely fills the mold space within said die set, said die set consisting of said segmented female die having an outer edge defined by the periphery of said segmented female die and a mating punch, means to interlock said female die segments together in the assembled condition of said female die to prevent substantially all relative motion among said segments during use of said closed die set, said interlock means being formed entirely integrally in said female die segments, said interlock means being free of any interfitting pin and mating aperture arrangements, said integral interlock means permitting interchange of some worn one or more of said die segments for new such segment or segments after use of the assembled female die; said interlock means comprising at least a pair of protrusions and a corresponding number of mating guideways, each of said protrusions being of essentially rectilinear cross-sectional shape when viewed in a plane parallel to the direction of punch motion; said interlock means being located in the facing surfaces between at least two of said female die segments, said facing surfaces being positioned generally parallel to said direction of punch motion with respect to said female die, all of said protrusions and said guideways being so positioned on their respective die segments that they snugly fit together in the assembled together condition of said female die, each said protrusion extending to an outer edge of its respective die segment, all of said segments defining a shape which when viewed in a plane perpendicular to said direction of punch motion is generally a conical section, and said conical section shape being divided into said segments by lines which are generally chordal to said conical section shape.

20. A method of making a circular pre-assembled segmented female die for use in a closed die set, said closed die set being shaped to operate upon a billet of predetermined size and volume so that the part produced from said billet substantially entirely fills the mold space within said die set, said die set consisting of said segmented female die having an outer edge defined by the periphery of said segmented female die and a mating punch, the method comprising the steps of preparing a disc of die material substantially equal to the size of the completed segmented female die, cutting said disc in half, removing material from the cut face of each half, preparing center segments having a size substantially equal to the material removed from said disc, whereby all of said segments when assembled together will have a size substantially equal to the size of said disc and will be defined by lines which are generally chordal to said disc, providing interlock means between said halves and said segments, said interlock means in said halves being formed integrally therein during the aforementioned removing material step, making said interlock means free of any interfitting pin and mating aperature arrangements, said integral interlock means permitting interchange of some worn or more of said die segments for new such segment or segments after use of the assembled female die, forming said interlock means of at least a pair of protrusions and a corresponding number of mating guideways with each of said protrusions being of essentially rectilinear cross-sectional shape when viewed in a plane parallel to the direction of punch motion, locating said interlock means in the facing surfaces between at least two of said female die segments, positioning said facing surfaces generally parallel to the punch motion with respect to said female die, positioning all of said protrusions and said guideways on their respective die segments so that they snugly fit together in the assembled together condition of said female die, extending each of said protrusion to an outer edge of its respective die segment, assembling and interlocking said segments together, and mounting the assembled interlocked segments into a retainer ring adapted to fit into a press in which said assembled die is to be used.

4,377,086

SENSOR SYSTEM

Ernst Linder, Mühlacker; Klaus Müller, Tamm, and Helmut Maurer, Horrheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 9, 1980, Ser. No. 214,720

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1980, 3011569

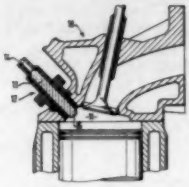
Int. Cl.³ G01L *23/22*

U.S. Cl. 73—35 **4 Claims**

1. In and for combination with an internal combustion engine, a sensor system for detecting oscillations occurring during knocking detonations in a cylinder of the internal combustion engine and employing at least one optical detector optically exposed to the combustion chamber having a light guide window facing the combustion chamber, wherein

the surface of the window (**15**, **15***a*, **15***b*, **15***c*) disposed on the side facing the combustion chamber comprises means for

enhancing the clean-scrubbing action of combustion gases passing the window at high velocity including at least one



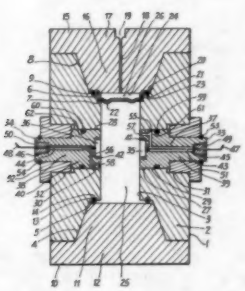
of: points (17, 18); edges (16) formed on said surface of the window.

4,377,087

DEVICE FOR ACOUSTICALLY CONTROLLING THE SETTING AND HARDENING CHARACTERISTICS OF CEMENTS

Francois Rodot, Pau, France, assignor to Societe Nationale Elf Aquitaine (Production), France

Filed Oct. 21, 1980, Ser. No. 199,283
Claims priority, application France, Oct. 11, 1979, 79 25327; Sep. 29, 1980, 80 20813
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—594 4 Claims



1. A cell for acoustically controlling the characteristics such as the setting and hardening characteristics of a material which passes from the liquid or paste-like state to the solid state, such as cement, comprising:

a cell body defining a cavity which forms a measuring chamber and which opens into the outer surface of said cell body through at least one passage adapted to contain a removable sealing plug,

said measuring chamber including two electro-acoustic transducers having planar, mutually opposed emitting and receiving surfaces,

said cell body being constituted by a hollow cylinder delimiting, by a cylindrical wall, a cavity comprising a median portion which constitutes said measuring chamber, two end portions of said cavity constituting two opposed passages adapted each to receive a removable sealing plug,

said cylindrical wall of said measuring chamber being provided with two recesses for reception of said two electro-acoustic transducers,

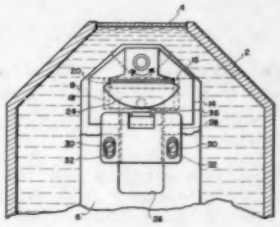
said cylindrical inner wall of the measuring chamber being provided near one of its ends with a bearing surface on which rests tightly a marginal portion of an elastic membrane separating a major portion of said measuring chamber, which includes the two transducers, from a secondary measuring chamber portion having a comparatively small volume and connected by a conduit to a hydraulic fluid injection means and to means for controlling the pressure of said fluid.

4,377,088

ANGULAR POSITION SENSOR

Donald A. Evert, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 14, 1981, Ser. No. 224,899
Int. Cl.³ G01N *29/00*; G01B *7/14, 7/30*
U.S. Cl. 73—640 4 Claims



1. A position sensor for sensing the position of a mechanically oscillating member, said oscillating member being rotationally oscillated about a predetermined axis, said position sensor comprising:

a magnetic element having an arcuate surface, the center of curvature of which is displaced from said axis mounted for oscillatory motion about said axis, said magnetic element establishing a magnetic field having a fixed orientation relative to said magnetic element;

a magnetic field responsive signal means fixedly positioned adjacent to but slightly spaced from said magnetic element, said signal means being responsive to the instantaneous value of the magnetic field presented thereto by said magnetic element, the displacement of the center of curvature of the arcuate surface and said axis causing said instantaneous value to be substantially linearly variable in accordance with the instantaneous position of said magnetic element relative to said signal means; and

means for oscillating said magnetic element coincidentally with said oscillating member to produce signals from said signal means representative of the instantaneous position of said oscillating member.

4,377,089

COMPRESSION TEST APPARATUS

Alan M. Lovelace, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, George C. Shanks, Malibu, Calif.

Filed Feb. 13, 1981, Ser. No. 234,223
Int. Cl.³ G01N *3/08*
U.S. Cl. 73—818 9 Claims

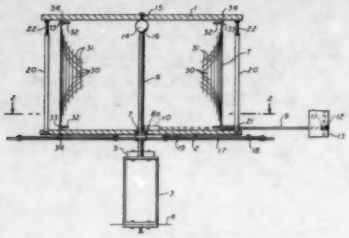
1. Apparatus for compressive testing of a test specimen comprising:

vertically spaced upper and lower platen members between which a test specimen may be placed;

fixed support means on which said platen members are supported, including a vertical post member;

load indicator means interposed between said upper platen member and the upper end of the vertical post member of said support means through which the total weight of said upper platen member and any additional weight placed theron may be supported by said support means; and

means for moving said lower platen member upwardly toward said upper platen member whereby an increasing



portion of said total weight is transferred from said load indicator means to said test specimen.

4,377,090

THROUGH-FLOW MONITOR FOR LIQUID OR GASEOUS MEDIA

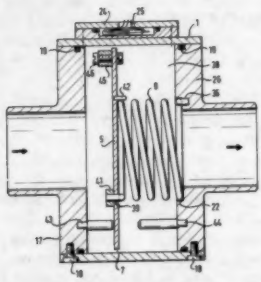
Gerhard W. Sealen, 58 Ronsdorferstrasse, 5630 Remscheid, Fed. Rep. of Germany

Filed Nov. 14, 1980, Ser. No. 206,985

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1979, 2946826

Int. Cl.³ G01F *1/28*

U.S. Cl. 73—861.74 **18 Claims**



1. A through-flow monitor for a fluid, the monitor comprising a housing having inlet and outlet ends and therebetween an inner chamber bounded by a cylindrical wall of constant diameter; connecting means at each of said inlet and outlet ends for connecting said housing into a flow duct for the fluid, with the cross-sectional area of said inner chamber being substantially larger than that of said flow duct; a shallow diaphragm having a peripheral edge with a diameter almost as large as that of said cylindrical wall concentrically disposed within said inner chamber, wherein said peripheral edge cooperates with said cylindrical wall to define a narrow annular gap for the flow of fluid past said shallow diaphragm and wherein said shallow diaphragm is movable under the force of fluid flow from a rest position to an operative position; first abutment means within said chamber defining said rest position; a coil spring disposed concentrically within said inner chamber, said coil spring having first and second ends one of which is secured to said housing and the other of which is fastened to said shallow diaphragm to carry and guide the same within said inner chamber, wherein said coil spring biases said shallow diaphragm towards said first abutment means; and means for detecting the presence of said shallow diaphragm when in said operative position.

4,377,091

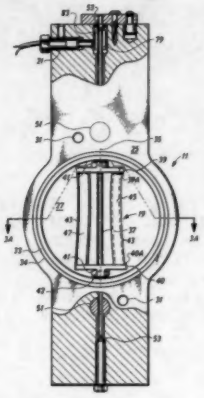
VERTICAL AXIS TURBINE FLOWMETER

Joseph P. DeCarlo, Wrentham, Mass., and Bernard R. Melancon, Warwick, R.I., assignors to The Foxboro Company, Foxboro, Mass.

Filed Mar. 2, 1981, Ser. No. 239,786

Int. Cl.³ G01F *1/05*

U.S. Cl. 73—861.87 **19 Claims**



1. Apparatus for measuring the flow rate of a fluid stream within a conduit, comprising:

support means mountable within said conduit;

an impeller assembly rotatably mounted on said support means for rotation about an axis and suspended within said fluid stream, said axis being transverse to the direction of flow of said fluid stream through said conduit, said impeller assembly including

a pair of impeller elements disposed symmetrically about said axis, each of said elements having diametrically opposed surfaces characterized by a high-drag coefficient and a low-drag coefficient respectively, said impeller elements being twisted uniformly about said axis such that a first straight line passing through said axis and the respective top ends of said elements defines an acute angle with a second straight line passing through said axis and the respective bottom ends of said elements, whereby for any rotational position of said impeller assembly about said axis, at least one of said impeller elements presents a portion of its high drag surface toward said fluid stream;

means for sensing the rate of rotation of said impeller assembly at a location external to said conduit; and

means for relating said rate of rotation to the flow rate of said fluid stream.

4,377,092

WELL PUMP JACK WITH CONTROLLED COUNTERBALANCING

Victor H. Garmong, Kennerdell, Pa., assignor to Pioneer Electric Supply Co., Inc., Franklin, Pa.

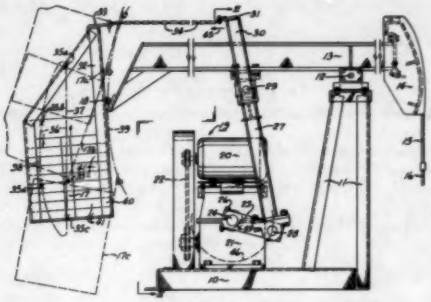
Filed Jul. 14, 1980, Ser. No. 168,035

Int. Cl.³ F16H *21/32*

U.S. Cl. 74—41 **18 Claims**

1. A well pumping apparatus having a Samson post, a walking beam pivotally mounted intermediate its end portions on said Samson post, means to connect a string of sucker rods to one end portion of said walking beam, a counterbalancing weight carried by the other end portion of said walking beam and connected to said walking beam for relative movement thereto, prime mover means operatively connected to said walking beam to rock said walking beam up and down on said Samson post in operation through pumping cycles, and coun-

terbalancing weight drive means operatively connected to said counterbalancing weight to drive said counterweight in a predetermined path of movement relative to said walking beam during pumping cycles, the improvement comprising, control means to control said counterbalancing weight drive means during each pumping cycle such that the center of gravity of said counterbalancing weight is required to follow a



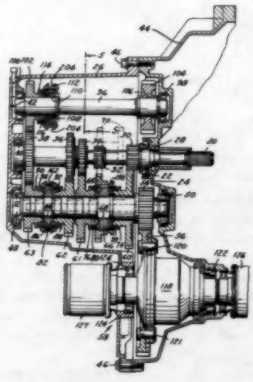
predetermined vertical pattern of movement throughout each pumping cycle wherein the center of gravity travels in a substantially straight line while traveling upward and in a line of curvature directed outwardly away from the Samson pivot while traveling downwardly and wherein said control means is adapted to control said straight line of upward movement to be substantially vertical.

4,377,093

SHIFT MECHANISM FOR A FIVE SPEED TRANSAXLE TRANSMISSION

David A. Janson, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 3, 1980, Ser. No. 126,930
Int. Cl.³ G05G *5/10*; F16H *3/38*
U.S. Cl. 74—477 **3 Claims**



1. A shift mechanism for controlling a multiple speed transmission comprising:

a torque input shaft;

a first countershaft;

a second countershaft;

gearing defining multiple torque delivery paths including multiple pairs of gears carried by said input shaft and said first and second countershafts;

synchronizer clutch means carried by the first and second countershafts and associated with one gear of each pair for drivably connecting said one gear to its associated countershaft;

a differential gear assembly;

torque output gearing connecting said differential gear assembly with said first and second countershafts whereby torque is delivered from said gearing to said differential assembly;

a first shift rail and a second shift rail;

first and second shift forks mounted slidably on said first shift rail, and a third shift fork mounted slidably on said second shift rail for moving the synchronizer clutch means thereby driveably connecting one gear of each gear pair to its associated countershaft;

a linkage mechanism for effecting shifting movement of said first, second and third shift forks including:

a shift selector shaft adapted for rotary and axial movement mounted in transverse disposition with respect to said first shift rail;

a relay lever mounted for rotation and sliding motion in transverse disposition with respect to said shift selector shaft having first and second operating arms engaged respectively with said shift selector shaft and said first shift rail whereby axial movement of said selector shaft produces axial movement of said first shift rail and rotary motion of said selector shaft produces rotary motion of said first shift rail;

a first bellcrank pivotably mounted in transverse disposition with respect to said first shift rail having a first end engaged with said third shift fork;

a reverse idler pinion slidably mounted on a support shaft for movement into and out of engagement with reverse drive gears on said input shaft and said first countershaft;

a second pivotably mounted bellcrank having a first end disposed adjacent said first shift rail and a second end engaged with and adapted to slide said reverse idler pinion on its support shaft;

a shift collar secured to said first shift rail adjacent said relay lever having an operating arm adapted to engage the first end of said second bellcrank, whereby said second bellcrank is engaged by the arm of said shift collar upon rotation of said first shift rail whereafter said second bellcrank is pivoted and the reverse idler pinion is shifted as a result of axial motion of said first shift rail and said selector shaft; and

selector means mounted on said first shift rail adapted to rotate into registry selectively with the second end of said first bellcrank and the first and second shift forks whereby axial movement of said first shift rail produces axial shifting movement of said synchronizer clutch means.

4,377,094

LIQUID COOLED DISC BRAKE FOR DIFFERENTIAL OF A TRACKED VEHICLE

James A. Thompson, and Micheal G. Beeley, both of Logan, Utah, assignors to Logan Manufacturing Company, Logan, Utah

Filed Nov. 28, 1979, Ser. No. 97,915
Int. Cl.³ F16H *1/44*; F16D *65/84*
U.S. Cl. 74—710.5 **17 Claims**

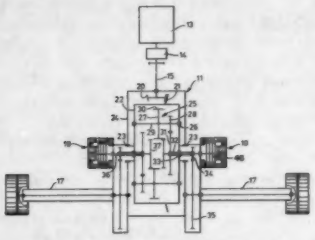
1. A liquid cooled disc brake adapted for installation upon the steering differential of a tracked vehicle in controllable braking engagement to one of the rotating braking axles thereof, said brake comprising:

a disc housing adapted to accept the braking axle rotatably therethrough;

serially interleafed, concentric discs within the housing, alternate ones of which are keyed in fixed angular, axially slideable relationship to the wall of the housing and the braking axle;

cooling liquid passage means for directing a flow of cooling liquid between and over the opposing faces of the interleafed discs;

controllable hydraulic piston means for providing axial force urging the faces of the interleafed discs together;
a hydraulic fluid passage through the disc housing for directing pressurized hydraulic fluid from outside the brake into actuating contact with the piston means;
a cooling liquid inlet passage through the housing for directing cooling liquid to the interior thereof, along with a cooling liquid outlet passage through the housing, so that



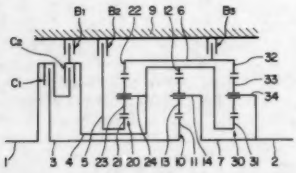
the cooling liquid may be pumped therethrough between the adjacent faces of the interleafed discs;
a fluid passage in the housing joining the cooling liquid inlet passage and the hydraulic fluid passage; and
check valve means at the juncture of the hydraulic fluid passage and said joining fluid passage for balancing pressure across the hydraulic piston when the hydraulic fluid is not pressurized.

4,377,095

SPEED CHANGE GEAR SYSTEM

Noboru Murakami; Hiromi Hasegawa, both of Nagoya, and Yoshinobu Iwase, Toyokawa, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 3, 1980, Ser. No. 203,518
Claims priority, application Japan, Nov. 7, 1979, 54-144900
Int. Cl.³ F16H *57/10*
U.S. Cl. 74—759 **6 Claims**



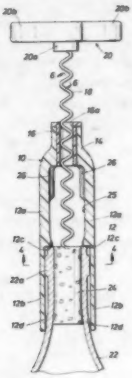
1. In a speed change gear system of a type including gear casing, an input shaft, an output shaft, three sets of planetary gear means each having a central sun gear, a ring gear internally toothed, a set of planetary pinion gears for meshingly connecting said sun gear and said ring gear and a revolving carrier rotatably supporting said pinion gears, clutch means, and brake means, a speed change gear system comprising:
a first integrally rotatable unit including a sun gear in a first planetary gear set, the unit being connectable with an input shaft through first clutch means;
a second integrally rotatable unit connectable to the input shaft through second clutch means and including a revolving carrier in a second planetary gear set, a ring gear in said first planetary gear set and a sun gear in a third planetary gear set;
a third integrally rotatable unit including a sun gear in the second planetary gear set;
a fourth integrally rotatable unit including interconnected ring gears in the second and third planetary gear set;
a fifth integrally rotatable unit connected to the output shaft including interconnected revolving carriers for the planetary pinion gears in the first and third planetary gear sets;
three brake means each connected to the gear casing as a stationary member and being operable on said second, third and fourth integrally rotatable unit, respectively; and
said two clutch means each for connecting and disconnecting said first unit with the input shaft and said second unit with the input shaft, respectively; wherein said first through fifth integrally rotatable units constitute a gear train.

4,377,096

CORK EXTRACTOR

Herbert Allen, Houston, Tex., assignor to Hallen Company, Houston, Tex.

Continuation-in-part of Ser. No. 17,598, Mar. 5, 1979, Pat. No. 4,291,597, which is a continuation-in-part of Ser. No. 925,365, Jul. 17, 1978, Pat. No. 4,276,789. This application Jan. 7, 1981, Ser. No. 223,170
The portion of the term of this patent subsequent to Jul. 7, 1998, has been disclaimed.
Int. Cl.³ B67B *7/00*
U.S. Cl. 81—3.38 A **25 Claims**



1. Apparatus for extracting a cork from a bottle comprising:
a corkscrew;
guide means receiving said corkscrew and permitting longitudinal and rotative movement of said corkscrew;
bottle-engaging means connected to said guide means for positioning said guide means and said corkscrew in generally coaxial alignment with the neck of said bottle, said bottle-engaging means including stop means for limiting downward movement of said guide means with respect to said bottle;
spacer means interconnecting said guide means and said bottle engaging means and spacing said guide means upwardly from said bottle engaging means, said spacer means defining an opening for receipt of said cork as it emerges from said bottle;
catch means adjacent said spacer means in said opening engageable with said cork as it emerges from said bottle to prevent rotation of said cork;
and abutment means carried by said corkscrew for limiting downward movement of said corkscrew with respect to said guide means;
said corkscrew being of a length such that, when said abutment means is engaged to so limit downward movement of said corkscrew, said corkscrew extends into said cork receiving opening whereby said cork may move threadedly upwardly on said corkscrew as said corkscrew is rotated to withdraw said cork from said bottle.

4,377,097

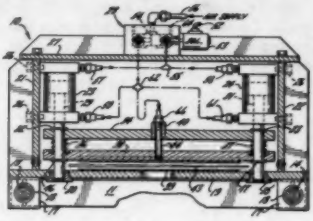
SHUTTLE MACHINE TOOL

Joseph E. Calvano, 10542 Walden Pkwy., Chicago, Ill. 60643

Continuation-in-part of Ser. No. 12,870, Feb. 16, 1979, abandoned. This application Mar. 21, 1980, Ser. No. 132,508

Int. Cl.³ B26F 1/06

U.S. Cl. 83—98 6 Claims



1. An apparatus for performing work operations on a relatively thin web comprising a structural frame through which the web is advanced, a chassis having a tool bearing element upon which a tool is mounted, means supporting said chassis on said structural frame for movement in the direction said web is advanced, said chassis having web clamping means for temporarily engaging the moving web and causing said chassis to be moved in unison with said web, said clamping means including a movable clamping element and an opposing element between which said moving web passes, said clamping element being disposed between the tool-bearing element and said opposing element and said clamping element being apertured to permit passage of the tool therethrough, engagement means for moving the clamping elemeat toward said opposing element for clamping the moving web therebetween, said engagement means including a drive cylinder mounted on said chassis having a piston shaft passing through the clamping element and tool-bearing element, a spring yieldably separating the tool-bearing element from the clamping element, and means for actuating said drive cylinder for driving said clamping element into clamping engagement with the web and then for further driving said tool-bearing element against the biasing force of said spring separating said tool-bearing element and said clamping element to effect a work operation on said web while said clamping means is in engagement with said web; and means for unclamping said clamping means and returning said chassis to an original position after completion of said work operation.

4,377,098

APPARATUS FOR SIMULTANEOUS SEVERING OF PLURAL MOVING PARALLEL RODS

Dietrich Bardenhagen, Hamburg; Nikolaus Häusler, Oststeinbek; Helmut Niemann, Hamburg; Heinz Greve, Hamburg, and Karl-Heinz Schlüer, Hamburg, all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

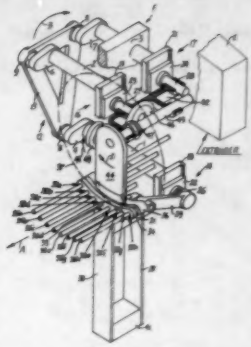
Filed Mar. 26, 1981, Ser. No. 248,012

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1980, 3012343

Int. Cl.³ A24C 5/28

U.S. Cl. 83—310 9 Claims

1. Apparatus for simultaneously severing a plurality of parallel rods which move axially at the same speed along predetermined paths and in a predetermined direction, particularly for subdividing continuous rods into sections which constitute or form part of smokers' products, comprising a knife having a cutting edge arranged to repeatedly orbit about an axis which is at least substantially parallel to said direction and to thereby move along a further path which intersects said predetermined paths at least during a portion of each n^{th} orbital movement of said cutting edge about said axis, a shaft defining said axis and supporting said knife, and a bearing for said shaft; a plurality of rod guide means, one for each rod, provided in close proximity of said further path; and means for moving said guide means and said knife in said direction while said cutting edge intersects said predetermined paths, including a plurality of parallel cranks having arms supporting said bearing and crankshafts supporting said arms and rotatable about axes which are normal to the axis of said shaft.



4,377,099

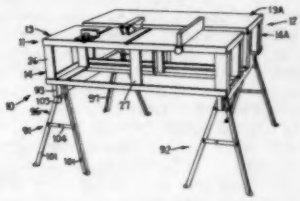
MODULAR TABLE SAW

George E. Howe, 3685 Blue Star Hwy., Hamilton, Mich. 49419

Filed Mar. 9, 1981, Ser. No. 241,904

Int. Cl.³ B27B 5/22

U.S. Cl. 83—467 R 11 Claims



1. In a portable table assembly for a hand electric circular saw of the kind having a base plate and a motor rotated circular saw blade, said portable table assembly comprising:

a boxlike saw table for supporting and guiding a workpiece past said saw blade and including a substantially planar horizontal top pendently supporting said portable circular saw therebeneath with a blade slot permitting said blade to rise upwardly through said top and an upstanding rectilinear base having upstanding opposite sides supporting opposite edges of said top;

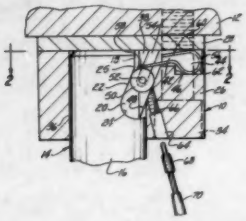
a boxlike back-up table positionable behind said saw table for guiding portions of said workpiece cut by said saw and including a substantially planar horizontal top and an upstanding rectilinear base having upstanding opposite sides supporting opposite edges of said top, one of said bases having an open bottom;

means for supporting said bases of said tables on a common plane, the heights of said saw table and back-up table being the same so that their tops are coplanar with their bases on said common plane;

said open bottom of said base of one said table being larger than said base of the other said table, said other table being

nestable in said one table by reception through the open bottom of the latter.

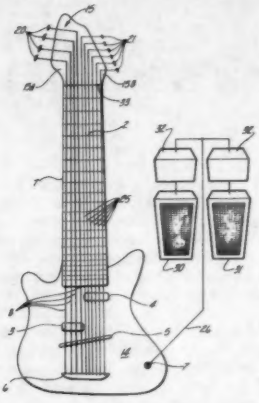
4,377,100
PUNCH RETAINER
Bernard J. Wallis, 25200 Trowbridge Ave., Dearborn, Mich. 48124
Filed Feb. 19, 1981, Ser. No. 236,025
Int. Cl.³ B26F *1/14*
U.S. Cl. 83—698 7 Claims



1. In combination a punch having a shank of circular cross section and provided with a non-circular punching portion at its lower end, said punch having a flat side wall portion at its upper end and an axially extending, radially inwardly inclined flat wall extending downwardly from the lower end of said upper flat wall portion, and a punch retainer having a circular bore sized to receive said punch with a close fit and having abutment means against which the upper end of the shank of the punch is adapted to bottom when the punch is fully inserted in said bore, said retainer also having a recess therein opening radially into said bore, said recess having a vertically extending flat wall inclined downwardly toward the vertical axis of said bore at an angle slightly greater than the angle of inclination of the inclined wall on the punch, a latch in said recess having a central axis extending transversely of the axis of said bore and diametrically opposed cylindrical surface portions parallel to said axis and adapted to engage with wedging tangential line contact said flat inclined walls of said punch and recess to prevent withdrawal of the punch downwardly through said bore and a leaf spring of flat cross section in said recess having one end portion retained in said recess and its opposite end portion bearing flatwise against the top side of said latch and orienting the latch so that its axis is perpendicular to the axis of said bore and resiliently urging said latch downwardly into said tangential contact with said inclined walls of said punch and recess, said leaf spring being of sufficient strength to urge said latch downwardly against said inclined walls of the punch and recess so as to rotate the punch about its vertical axis in said bore to a position wherein said tangential contact lines are parallel to each other and perpendicular to the vertical axis of the punch, and means limiting radial outward displacement of said latch such that the punch can be inserted in said bore to bottom against said top plate only when the flat side wall portion of the punch is generally radially aligned with said recess, said latch comprising a cylindrical roller having stub shafts projecting axially from the opposite ends thereof, said recess having guide tracks at each side thereof into which said stub shafts project for retaining the roller in said recess.

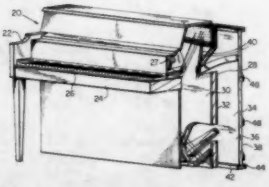
4,377,101
COMBINATION GUITAR AND BASS
Sergio Santucci, Via Ostiense, 30, Rome, Italy (00154)
Continuation-in-part of Ser. No. 55,895, Jul. 9, 1979, abandoned.
This application May 11, 1981, Ser. No. 262,325
Int. Cl.³ G10D *1/08*; G10H *3/18*
U.S. Cl. 84—1.16 9 Claims

1. A musical instrument combining a guitar having typical guitar strings and a bass having heavier low frequency bass strings into a single instrument retaining the guitar strings and the heavier low frequency bass strings, said instrument including a body portion, a tailpiece fixedly mounted to said body portion, a neck portion having frets thereon fixedly attached to said body portion in line with said tailpiece, and an oblique transveral bridge also mounted to said body portion separate and apart from said tailpiece and extending in a plane perpendicular to said body portion and at the same time being in a plane oblique to the axis of said neck portion, a pallet portion provided on said neck portion and having a bass string and a guitar string portion, said bass string portion having a plurality



of bass string tuning devices mounted thereto, said guitar string portion having a plurality of guitar string tuning devices mounted thereto, a plurality of bass strings attached one each between said bass string tuning device and said tailpiece and passing over said oblique transversal bridge, a plurality of guitar strings attached one each between said guitar string tuning devices and said tailpiece and passing over said oblique transversal bridge, a first sound pick-up mounted beneath said bass strings, a second sound pick-up mounted beneath said guitar strings, and a stereo outlet connected to said first and said second sound pick-ups.

4,377,102
PIANO CONSTRUCTION
Robert J. Mayerjak, Torrington, Conn., assignor to Currier Piano Company, Inc., Marion, N.C.
Filed Apr. 30, 1981, Ser. No. 259,082
Int. Cl.³ G10C *3/04, 3/12*
U.S. Cl. 84—184 31 Claims



1. A piano string panel assembly for carrying the strings of a piano, said panel assembly comprising a panel to which panel all of the ends of such strings may be anchored, said panel having a near face and a far face opposite and generally parallel to said near face, said panel also having at least one opening therein extending through its thickness between said near and far faces for accommodating the bridge or bridges of an associ-

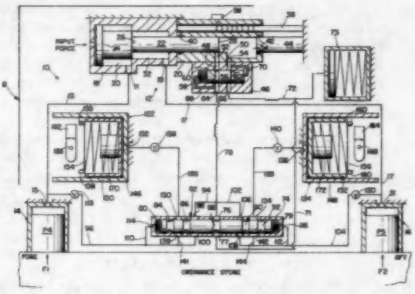
ated soundboard, said panel throughout substantially all of its extent as surrounded by its outer peripheral edge comprising a relatively thick core layer of relatively low modulus of elasticity material having near and far faces, a near relatively thin face layer of relatively high modulus of elasticity material bonded to said near face of said core layer, and a far relatively thin face layer of relatively high modulus of elasticity material bonded to said far face of said core layer; and means for connecting all of the strings of a piano to said panel so that each string is supported at both of its ends by said panel for extension adjacent and parallel to said near panel face and so that each string extends over one of said at least one opening in said panel for cooperation with a bridge of the associated soundboard.

4,377,103

DUAL DEPENDENT STORES EJECTOR ASSEMBLY FOR ANGULAR RATE AND POSITION CONTROL

Gerald E. Kovalenko, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 14, 1980, Ser. No. 168,987
Int. Cl.³ B64D *1/04*; F41F *5/02*
U.S. Cl. 89—1.5 R **16 Claims**



10. A variable force, dual ejector for a weapon stores structure adapted to be used in conjunction with a store carriage means on an aircraft for imparting an angular discharge attitude or angular rate of discharge to the store, comprising:

fluid actuated ejector means for ejecting the store from the aircraft;

a source of working fluid in effective fluid communication with said ejector means;

means for fluidly interconnecting said fluid source with said ejector means;

said fluid source including means forming a plurality of distinct fluid chamber means; the flow of fluid from a first of said chamber means adapted to flow primarily to a first of said ejector means and the flow of fluid from a second of said chamber means adapted to flow primarily to a second of said ejector means;

means for distributing the flow of fluid from a third chamber means to said first and second ejector means;

whereby said distributing means allocates the fluid from said third chamber means so as to supplement the flow of fluid to said first and second ejector means.

4,377,104

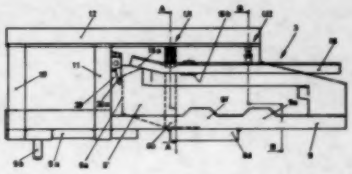
LOADING TRAY

Olle Gustavsson, and Göran Sundmar, both of Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

Filed Dec. 18, 1980, Ser. No. 217,637
Claims priority, application Sweden, Dec. 18, 1979, 7910439
Int. Cl.³ F41F *9/00*
U.S. Cl. 89—45 **11 Claims**

1. In a large calibre firearm having a loading unit positionable from a first ammunition unit receiving position, to a laterally displaced loading position along the extension of the axis of said firearm bore, wherein a rammer unit displaces said ammunition unit into said firearm, a loading tray for holding said ammunition unit comprising:

a longitudinal extending tray portion having longitudinal side portions connected to a bottom portion, one of said side portions extending vertically and thence laterally over top of said bottom portion, said side portions and bottom portions open to receive an ammunition unit; and



an elongate element suspended to said side portion lateral extension for rotation, through spring means in a direction of said side portions,

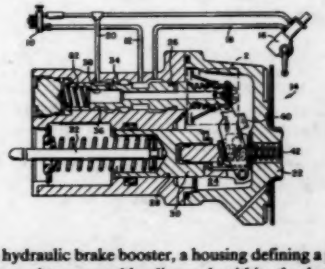
whereby during movement of said loading tray towards said loading position said elongate element fixes said ammunition longitudinally, and during a subsequent ramming function serves as a rearing guard for the ammunition.

4,377,105

HYDRAULIC BRAKE BOOSTER

Douglas A. Fecher, Three Oaks, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jan. 12, 1981, Ser. No. 224,360
Int. Cl.³ F15B *13/10*
U.S. Cl. 91—391 R **5 Claims**

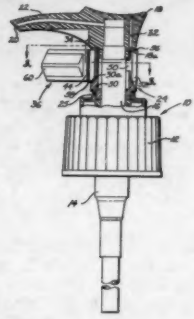


1. In a hydraulic brake booster, a housing defining a pressure chamber, a piston movably disposed within the housing in response to fluid pressure communicated to the pressure chamber from a fluid pressure source, a control valve assembly movably disposed within the housing to control communication of said fluid pressure to the pressure chamber, the control valve assembly movably carrying a sleeve within the pressure chamber, an input member engageable with the sleeve to move the sleeve and control valve assembly and valve means carried by the control valve assembly within the pressure chamber to open communication between the pressure chamber and said fluid pressure source, characterized by said valve means defining a first position in engagement with said sleeve to provide a first opening leading to the pressure chamber, said valve means defining a second position spaced from said sleeve to provide a second opening leading to the pressure chamber, said second opening being different in size than said first opening and said valve means defining a third position substantially closing communication to the pressure chamber.

4,377,106
TAMPER-RESISTANT LOCKING CLIP FOR DISPENSING PUMPS

James P. Workman, Spring Hill, Kans., and Larry L. Hudson, Lee's Summit, Mo., assignors to Realex Corporation, Kansas City, Mo.

Filed Jun. 30, 1980, Ser. No. 164,306
Int. Cl.³ F15B *15/26*; F16K *35/00*; B67D *5/32*
U.S. Cl. 92—23 18 Claims



1. In combination with a dispensing pump having a plunger and annular means through which the plunger reciprocates, said plunger and said annular means having a pair of opposed surfaces which are axially spaced apart when the plunger is in an extended position relative to the annular means, a disposable lock separate from the pump for preventing depression of the plunger comprising:

a collar disposed about said plunger and between said surfaces in position to block depression of the plunger,

said collar having a pair of parts provided with a connection therebetween; and

a tab associated with said connection and operable only upon sufficient manual manipulation to destroy the connection and thereby release the collar from the plunger.

4,377,107
VENTILATION GRILLE STRUCTURE

Masao Izumi, Fujisawa, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Sep. 26, 1980, Ser. No. 191,131
Claims priority, application Japan, Nov. 21, 1979, 54-160353[U]
Int. Cl.³ F24F *13/14*
U.S. Cl. 98—40 V 1 Claim

1. A ventilation grille structure, comprising:

an air duct for directing an air flow therethrough, and having a pair of spaced parallel side walls, an upper wall connected at its opposite side ends to the upper ends of said side walls, and a lower wall connected at its opposite side ends to the lower ends of said side walls, said side walls and said upper and lower walls forming in combination said air duct having a substantially rectangular internal cross section;

a louver assembly comprising a louver frame having a pair of side wall portions facing said side walls of said air duct and rotatable about an axis fixed with respect to said air duct and substantially parallel with and spaced apart from said upper and lower walls of said air duct, an upper wall portion connected at its opposite side ends to the upper ends of said side wall portions and facing said upper wall of said air duct and a lower wall portion connected at its opposite side ends to the lower ends of said side wall portions and facing said lower wall of said air duct;

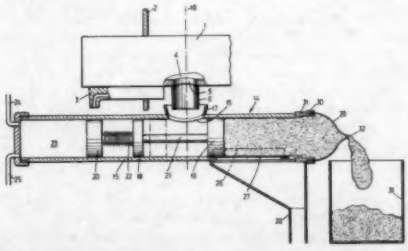
air guide means comprising upper and lower air guide plates respectively having widths substantially equal to the widths of said upper and lower wall portions of said louver frame, said upper air guide plate having one longitudinal end hingedly connected to said upper wall portion of said louver frame and said lower air guide plate having one longitudinal end hingedly connected to said lower wall portion of said louver frame; and

contact-holding means comprising portions of said side walls which are formed with a pair of upper guide grooves extending longitudinally of said air duct and having respective upper ends substantially flush with the inner face of said upper wall of said air duct, portions of said side walls which are formed with a pair of lower guide grooves extending longitudinally of said air duct and having respective lower ends substantially flush with the inner face of said lower wall of said air duct, a pair of upper guide pins sidewise outwardly projecting in opposite directions from the longitudinal ends of said upper air guide plate and slidably received in said upper guide grooves, respectively, and a pair of lower guide pins sidewise outwardly projecting in opposite directions from the longitudinal ends of said lower air guide plate and slidably received in said lower guide grooves, respectively.

4,377,108
COFFEE-MAKING MACHINE

Arnold Rais, Basel, Switzerland, assignor to M. Schaerer A.G., Berne, Switzerland

Filed May 26, 1981, Ser. No. 266,932
Int. Cl.³ A47J *31/60*
U.S. Cl. 99—290 1 Claim



1. A coffee-making machine of the type having a drain pipe for evacuating rinse water containing coffee grounds, wherein the improvement is a means for separating the coffee grounds from the rinse water comprising:

a tubular jacket disposed substantially horizontally,

an inlet opening in the uppermost part of said jacket for admitting rinse water containing coffee grounds,

means defining a longitudinal slot in a lowermost region of said jacket situated substantially opposite said inlet opening and forming an outlet for evacuating rinse water, and strainer means covering said slot,

a detachable end piece formed of resilient material attached

to the end of said jacket nearest said slot and having an outlet aperture of smaller cross-section than said jacket for evacuating coffee grounds,

a piston disposed in said jacket and slidable axially therein over a distance at least equal to the dimension of said inlet opening measured along the longitudinal axis of said jacket between a retracted position spaced rearwardly from said inlet opening on the side away from said outlet aperture to define with said tubular jacket an expanded chamber communicating with said inlet opening to receive a charge of rinse water containing coffee grounds and an extended position spaced forwardly from said inlet opening on the side toward said outlet aperture to close said inlet opening and define a constricted chamber wherein said coffee grounds are squeezed to expel waste water therefrom and to force coffee grounds through said outlet aperture, and

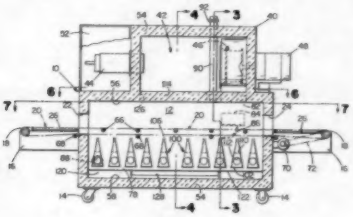
a hydraulic drive cylinder for moving said piston.

4,377,109

APPARATUS FOR BAKING FOOD PRODUCTS SUCH AS PIZZAS AND THE LIKE

Ernest C. Brown, Danvers, and Walter E. Buske, Amesbury, both of Mass., assignors to Wolverine Corporation, Methuen, Mass.

Filed May 22, 1981, Ser. No. 266,199
Int. Cl.³ A47J *37/00*
U.S. Cl. 99—401 **8 Claims**



1. An oven system for cooking food products and the like comprising

a thermally insulated chamber defining a treatment zone,

a conveyor for supporting products to be treated in said treatment zone,

means for moving said conveyor to transport products through said treatment zone,

said conveyor being substantially open to permit flow of air therethrough,

an array of nozzles below said conveyor and disposed along the length and across the width of said treatment zone,

a deflection surface above said conveyor forming an upper boundary of said treatment zone,

exhaust port means below said conveyor, heating means, and

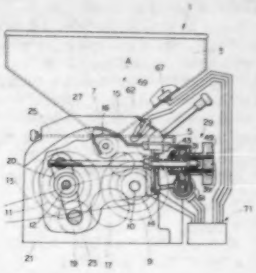
means for flowing gas heated by said heating means to said nozzle array for discharge with substantial upward velocity for flow through said conveyor against bottom surfaces of food products on said conveyor with a portion of said upwardly flowing gas that bypasses said products flowing upwardly through said treatment zone for impact against said deflection surface and drawing the deflected gas downwardly in countercurrent flow for impingement on the top surfaces of products being transported through said treatment zone in supplemental low velocity heat exchange treatment and flow through said conveyor for exhaust from said treatment zone through said exhaust port means.

4,377,110

AUTO-CONTROL EQUIPMENT OF HULL-REMOVING ROLL IN RICE-HULLING MACHINES

Hajime Matsumoto, Matsuyama, Japan, assignor to Iseki & Co., Ltd., Japan

Filed Dec. 11, 1980, Ser. No. 219,991
Int. Cl.³ B02B *3/04*
U.S. Cl. 99—489 **13 Claims**



1. An apparatus for separating hulls from unhulled rice comprising:

a hopper for accommodating unhulled rice, said hopper having a bottom opening for discharge of unhulled rice,

a first roll rotatable about a longitudinal axis below said opening,

a second roll located adjacent said first roll and rotatable about a longitudinal axis generally parallel to the longitudinal axis of the first roll, said second roll engaging said first roll below said bottom opening of the hopper,

drive means for rotating the first and second rolls in opposite directions whereby the hulls and rice are separated from unhulled rice delivered to said first and second rolls from said hopper bottom opening,

first means mounting said second roll for general lateral movement toward and away from said first roll,

second means for yieldably biasing the first means in a direction to move said second roll toward said first roll,

third means for sensing the contact pressure between the first and second rolls,

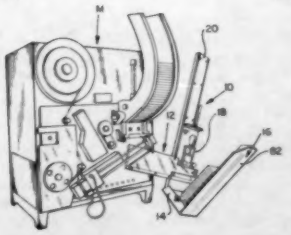
and fourth means responsive to said third means for moving said second roll toward said first roll and maintaining a substantially constant contact pressure between said first and second rolls.

4,377,111

CASSETTE STACKING DEVICE

David Kincheloe, West Chicago, and David Neathery, Wheaton, both of Ill., assignors to King Instrument Corporation, Westboro, Mass.

Filed Nov. 28, 1979, Ser. No. 98,124
Int. Cl.³ B65G *57/30*
U.S. Cl. 101—44 **23 Claims**



1. A cassette stacking apparatus for use with an adjacent machine, comprising:

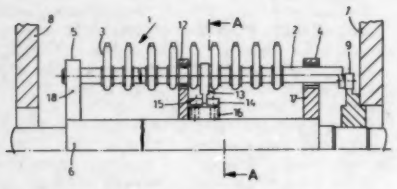
an elongated first chute, said chute being mounted at a selected angle with respect to a horizontal and adapted to receive cassettes from the adjacent machine and transport said cassettes to the lower end of said first chute;
stacking means mounted adjacent said lower end of said first chute, said stacking means being adapted to selectively position cassettes received from said lower end of said first chute in a stack;
control means connected to said first chute and to said stacking means, said control means being adapted to detect the presence of a cassette at said lower end of said first chute, to release the detected cassette to said stacking means and to provide selected control signals to said stacking means to cause the released cassette to assume a selected orientation with respect to said stack of cassettes; and
tab inserting means connected to said control means for inserting a locking tab to lock the reels of the cassette detected by said control means.

4,377,112

DEFLECTION-COMPENSATED SHEET GRIPPER ARRANGEMENT FOR ROTARY PRINTING MACHINE

Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Feb. 3, 1981, Ser. No. 231,158
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1980, 3004273
Int. Cl.³ B41F *21/04*
U.S. Cl. 101—246 **7 Claims**



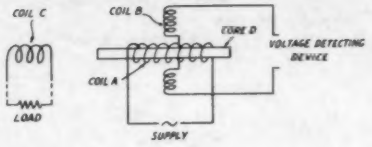
1. In a rotary printing machine having
a cylinder shaft (6), frame means (7, 8) rotatably supporting the shaft,
a deformation-compensated sheet gripper arrangement having a gripper spindle (2), means (17, 18) supporting the spindle on the shaft secured to the shaft and located adjacent respective axial ends of the gripper spindle;
a plurality of gripper fingers (3) carried by the gripper spindle,
and comprising, in accordance with the invention,
means insuring axial alignment of the gripper spindle (2) and hence of the grippers thereon with respect to a reference position on the shaft while permitting pivoting of the gripper spindle with respect to the shaft while the shaft is rotating comprising
axial alignment means for providing an axially predetermined position of the spindle (2) and hence the gripper fingers (3) thereon with respect to the shaft (6) including
a first axially fixed coupling means (13) secured to the spindle;
a second axially fixed coupling means (14, 15, 16) secured to the shaft;
and an axially positive coupling connection between said first and second coupling means, said coupling connection serving to maintain the axial position of the gripper spindle (2) with respect to the cylinder shaft (6) while permitting relative pivoting or rocking of the gripper spindle with respect to the shaft and, additionally, providing for clearance (d) and permitting relative motion in radial direction;
and axially floating bearing means (4, 5) secured to said spindle support means (17, 18) and journaling said gripper spindle (2) while permitting relative excursion of the gripper spindle with respect to the shaft at the positions of said spindle support means.

4,377,113

ROCKET FIRING SYSTEM

John R. Florence, 10 New Rd., Northbourne Bournemouth, England

Filed Feb. 9, 1981, Ser. No. 232,846
Int. Cl.³ F42C *19/12*
U.S. Cl. 102—209 **9 Claims**



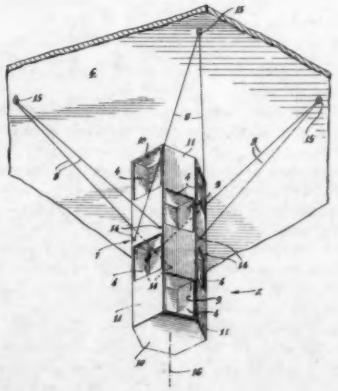
1. A rocket firing system comprising a magnetic core, a driver coil, said driver coil being mounted co-axially with said magnetic core, sensor coil means, said sensor coil means being inductively linked with said magnetic core and said driver coil, and a detector device, said detector device being connected to said sensor coil means to determine the state of any further coil brought into inductive linkage with the core.

4,377,114

HANGING STORAGE SHELF UNIT

R. Buckminster Fuller, 3501 Market St., Philadelphia, Pa. 19104

Filed Oct. 5, 1981, Ser. No. 308,245
Int. Cl.³ A47B *9/00*
U.S. Cl. 108—103 **11 Claims**



1. Rotatable storage compartment apparatus adapted to be suspended from an overhead structure, said storage compartment apparatus comprising:
a supporting member having fastening means for securing at least six tension lines for suspending said supporting member from an overhead structure with said supporting member defining a vertical central axis through said supporting member,

said fastening means being located near diametrically opposite points on said supporting member,

said tension lines being adapted to extend diagonally upwardly from said fastening means sloping away from said vertical axis for being attached to at least three attachment means secured to said overhead structure and being spaced uniformly around said vertical axis,

a first storage unit mounted above said supporting member,

a second storage unit mounted below said supporting member,

a vertical rotatable shaft connecting said first and second storage units, said shaft being concentric with said axis, and

bearing means for permitting free rotation of said units relative to said supporting member.

4,377,115

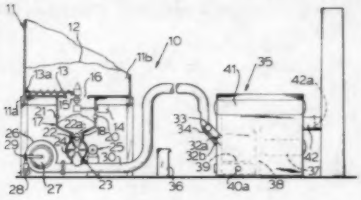
FURNACE FOR BURNING PARTICULATE WOOD WASTE MATERIAL

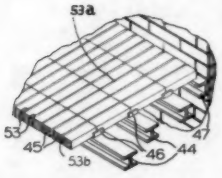
Bruce A. Kolze, 10356 San Carlos Dr., and Melvin W. Kolze, 10302 Don Pico Rd., both of Spring Valley, Calif. 92077

Division of Ser. No. 105,891, Dec. 21, 1979, Pat. No. 4,307,702. This application Aug. 11, 1981, Ser. No. 292,020

Int. Cl.³ F23B *7/00*

U.S. Cl. 110—234 **6 Claims**





1. A furnace for burning particulate wood waste material comprising:

at least one steam coil connected to a steam source for heating air surrounding said coil;

a means for transferring said heating air to at least one air intake disposed at a lower portion of said furnace;

a means disposed at an upper portion of said furnace for charging said furnace with particulate wood waste material entrained in an air flow;

a plurality of spaced parallel beams supported across a combustion chamber in said furnace in a plane between said upper and lower portions of said chamber and sufficiently above said air intake for developing a turbulent air flow through said beams;

a plurality of spaced parallel rows of bricks, each said row comprised of a plurality of individual bricks arranged in an end-to-end fashion, perpendicular to and directly and removably supported by said beam in a single plane;

a plurality of spacers directly and removably supported on said beams and disposed between adjacent rows of bricks, said spacers maintaining a selected open area between said adjacent rows of bricks to permit flow of heated turbulent air from said air intake through the open areas defined by said beams and bricks to contact and combust particulate wood waste material deposited on said bricks from said charging means, said selected open area being easily varied by changing the spacing between said bricks; and

an exhaust means for disposing of gases formed by combustion of said particulate wood waste material.

4,377,116

FURNACE FOR BURNING HUSK

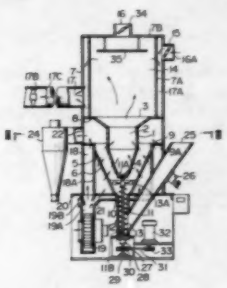
Toshihiko Satake, Higashihiroshima, Japan, assignor to Satake Engineering Co. Ltd., Tokyo, Japan

Filed Aug. 24, 1981, Ser. No. 295,712

Claims priority, application Japan, Aug. 27, 1980, 55/118699; Mar. 1, 1981, 56/32935

Int. Cl.³ F23G *3/00*

U.S. Cl. 110—235 **6 Claims**



1. A husk burning furnace characterized by comprising, in combination, an inner peripheral perforated wall defining a pot-like cylindrical primary gas burning chamber provided at its upper end with an opening constituting a hot gas outlet, an outer peripheral perforated wall surrounding said inner peripheral perforated wall and defining therebetween a conically annular husk smoke-burning chamber provided with a husk supply port opening at a lower part thereof, a husk supplying device connected to said husk supply port and adapted to forcibly move husk particles upwardly to feed and supply the latter, a secondary gas burning chamber connected to the upper end of said hot gas outlet, a hot gas discharge port communicated with said secondary gas burning chamber, a smoked-carbon discharge port adapted to upwardly discharge the husk particles smoke-carbonized in said smoke-burning chamber, and an outer cylindrical wall accommodating the above-mentioned constituents.

4,377,117

PARTICULATE WASTE WOOD FIRING SYSTEM

Bruce A. Kolze, 10356 San Carlos Dr., and Melvin W. Kolze, 10302 Don Pico Rd., both of Spring Valley, Calif. 92077

Division of Ser. No. 105,891, Dec. 21, 1979, Pat. No. 4,307,702. This application Aug. 11, 1981, Ser. No. 291,965

Int. Cl.³ F23G *5/00, 7/00*

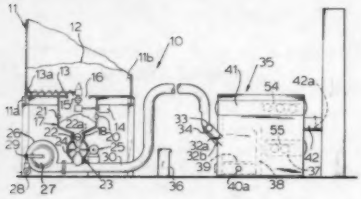
U.S. Cl. 110—248 **14 Claims**

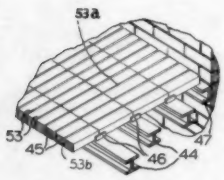
1. In a particulate waste wood firing system which includes the combination of a particulate waste wood material storage container and bottom unloader therefor having a central opening in the bottom of said container, a radially free-sweeping conveyor screw rotatable within said container operable to unload stored particulate material through said opening, a hopper connected to the bottom of said container and disposed immediately below said central opening for receiving discharged particulate material, a control means mounted in said hopper and operably connected to said conveyor screw to selectively vary the amount of particulate material discharged into said hopper in response to a measured accumulation level of particulate material therein, a choke screw conveyor posi-

tioned below said hopper for transporting a controllable amount of said material away from said hopper, a rotary feeder positioned at the output end of said choke screw conveyor for segregating constant volume amounts of said particulate material and moving such volume away from said choke screw conveyor, a duct connecting said rotary feeder with a combustion chamber within a particulate material burning means having two material inputs, a means for producing fire within said chamber and an exhaust outlet which leads to a stack, the improvement comprising:

at least one heated air duct disposed near a base of said combustion chamber and connected to a pressurized source of heated air;

a grate for receiving and supporting particulate wood waste material from each of said two material inputs, said grate disposed sufficiently above said heated air duct and having selectively adjustable openings therein for developing





and controlling a turbulent flow of heated air through said grate from said heated air duct within said combustion chamber and for developing a high temperature gradient from immediately beneath said grate to the area above said grate; a plurality of spaced parallel beams transversing said combustion chamber in a plane above said heated air duct and below said particulate material inputs;

a plurality of parallel rows of bricks, each said row comprised of a plurality of individual bricks arranged in abutting fashion perpendicular to and directly and removably supported by said beams in a single plane; and a plurality of spacers directly and removably supported on said beams and disposed between at least some adjacent rows of bricks, said spacers maintaining said selected open area between said adjacent rows of bricks to control flow of heated turbulent air from said heated air duct through said grate.

4,377,118

PROCESS FOR REDUCING SLAG BUILD-UP

Anthony J. Sadowski, Naperville, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Dec. 21, 1981, Ser. No. 332,379

Int. Cl.³ F23B *7/00*; C10L *10/04*

U.S. Cl. 110—343 **5 Claims**

1. A method for reducing slag build-up in a cyclone furnace comprising:

introducing into a cyclone furnace at least one of a slag viscosity modifier and a combustion adjuvant together with the secondary air stream, wherein said slag viscosity modifier and combustion adjuvant are formed as particles of sufficient size and density so as to be substantially conveyed to the wall of said cyclone furnace by centrifugal force without passing into the combustion site of said cyclone furnace.

2. The method of claim 1 wherein at least one of said slag viscosity modifier and said combustion adjuvant are fluid at the operating temperature in the area of said wall of said cyclone furnace.

4,377,119

METHOD FOR BURNING MATERIALS HAVING COMPONENTS THAT ARE DIFFICULT TO BURN OUT, AND APPARATUS FOR CARRYING OUT THE SAME

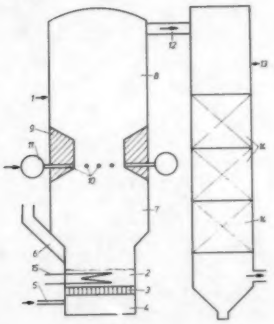
Rolf Noack, Oberhausen, Fed. Rep. of Germany, assignor to Deutsche Babcock Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Oct. 8, 1980, Ser. No. 195,114

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1980, 3003245

Int. Cl.³ F23G *5/00*

U.S. Cl. 110—346 **7 Claims**

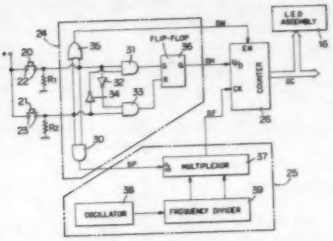


1. A method for burning materials having components that are difficult to burn out and which tend to be adhesive upon heating, comprising the steps of: forming a turbulent layer; connecting said turbulent layer with a combustion chamber; burning said materials in said turbulent layer and said combustion chamber; distributing combustion air to said turbulent layer and said combustion chamber for removing a portion of heat that is released, so that said combustion chamber retains a minimum temperature above a predetermined level, said combustion chamber having said minimum temperature for complete burning therein of combustible gases and vapors, said minimum temperature being controlled by distribution of said combustion air dependent on the heat balance of the gross composition and calorific values of the materials to be burned, residual combustion air being fed into said turbulent layer, heat being removed from said layer through radiating surfaces having dimensions dependent on the composition of fuel and on the proportion of total combustion air initially supplied to said layer, said materials being converted to a combustible state in a primary stage by applying heat obtained from incomplete combustion of the materials in said turbulent layer which produces combustible gases and vapors burned in said combustion chamber.

4,377,120
PATTERN SELECTION SYSTEM FOR A SEWING MACHINE

Masataka Kato, and Nobuyasu Oshima, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 22, 1981, Ser. No. 256,400
Claims priority, application Japan, May 14, 1980, 55-63680
Int. Cl.³ D05B *3/02*
U.S. Cl. 112—158 E **5 Claims**



1. A pattern selection system for a sewing machine having instrumentalities including a reciprocatory needle and capable of forming a succession of stitches placed in a selected one of multiple patterns, data generating means operating synchronously with reciprocation of said needle for generating stitch position data which regulates the positioning of each stitch in said selected pattern, and means for actuating said instrumentalities according to said stitch position data, comprising:

pattern indicating means disposing on the front of said machine and operative to selectively indicate a pattern out of said multiple patterns;

at least two manual members disposed closely to each other on the front of said machine and manually operable to shift the pattern indication of said pattern indicating means in one of two predetermined indication sequences reversed to one another; and

pattern selection controlling means for executing a series of functions according to the operational state of said manual members, said series of functions including a first function for selecting one of said two indication sequences according to the operational order of said manual members, a second function for selecting one of two indication shifting modes, which are predetermined to shift said pattern indication at different time intervals, dependent upon operation of one or two of said manual members, and a third function for controlling the operation of said pattern indicating means so as to shift said pattern indication in said selected indication sequence and in said selected indication shifting mode and to finally indicate a selected pattern.

4,377,121
BOBBIN CASE

Shunichi Teranishi, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 18, 1981, Ser. No. 245,043
Claims priority, application Japan, Mar. 28, 1980, 55-041700[U]
Int. Cl.³ D05B *57/14*
U.S. Cl. 112—231 **3 Claims**

1. A bobbin case for a shuttle around which a rotary hook is rotated, said bobbin case comprising:

an upper portion made of metal having a plurality of holes formed therein, each of said holes forming a stepped portion therein,

a plurality of pins respectively mounted in said holes,

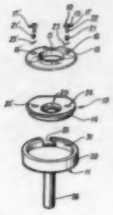
each of said pins further comprising at an upper end portion and a lower end portion thereof, respectively, a head and a key,

opposite ends of said key projecting from said lower end portion,

a plurality of springs respectively being positioned adjacent said pins,

each of said springs being compressed between said head and said stepped portion of each of said holes and

a plastic lower portion having a plurality of holes formed therein corresponding to said holes of said upper portion, respectively,

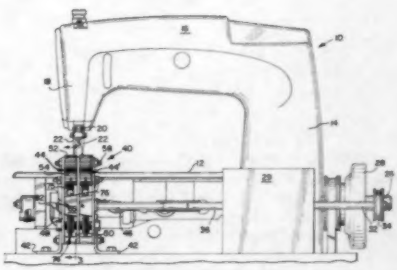


each of said holes of said lower portion including a first portion allowing vertical movement of said pin with said key against said spring, a second portion allowing rotation of said pin with said key therein, and a stepped portion formed between said first portion and said second portion, said stepped portion of said lower portion engaging said key after rotation of said pin.

4,377,122
ELASTIC METERING DEVICE FOR SEWING MACHINE

Ronald J. Boser, Dix Hills, and Henry J. Watts, East Northport, both of N.Y., assignors to Union Special Corporation, Chicago, Ill.

Filed Oct. 2, 1981, Ser. No. 308,020
Int. Cl.³ D05B *3/12, 21/00, 27/16*
U.S. Cl. 112—265.1 **30 Claims**



1. In combination with a sewing machine having reciprocal needle means adapted to secure a pair of elastic tapes to a waistband, a tape delivery apparatus comprising:

a pair of substantially identical mechanisms which are operated by a common input shaft, each mechanism being adapted to advance one of said elastic tapes; and

individual operator controlled means operatively associated with each of said mechanisms for selectively controlling the advance of tape to said sewing machine whereby two tapes having varying degrees of tension may be delivered to the machine simultaneously.

29. A method for advancing at least two elastic strips to a sewing machine comprising the steps of:

feeding and tensioning one of said elastic strips in the proximate area of the sewing machines at a first advance rate; and

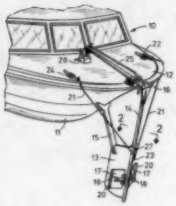
simultaneously feeding and tensioning the other of said elastic strips in the proximate area of the sewing machine at an advance rate different from the first advance rate.

4,377,123

BOAT STABILIZER APPARATUS

Lester L. Jackson, 1484 S. Main, Salt Lake City, Utah 84115

Filed Sep. 8, 1980, Ser. No. 185,346
Int. Cl.³ B63B *21/48*
U.S. Cl. 114—126 **4 Claims**



1. Boat stabilizer apparatus, comprising in combination:
an elongate shaft having means at one end thereof for connecting to the hull of a boat, so that said shaft extends downwardly below the boat hull;
stabilizer fin means having mutually opposing sides and being fixedly attached to said elongate shaft at the opposite end of said shaft;
a pair of baffle means each of which is hingedly attached at one edge thereof to a respective side of said stabilizer fin means;
a pair of vertical flange means each of which is attached to the outer vertical edge of a respective one of said pair of baffle means, said flange means being attached at such an angle to said baffle means that said flange means diverge outwardly from said stabilizer fin means, and hold said baffle means in a closed position relative to said stabilizer fin means when the boat is moving forward and hold said baffle means in an open position when the boat is moving rearwardly; and
baffle stop means mounted respectively on said pair of baffle means for limiting the distance to which the baffle means can extend from said stabilizer fin means.

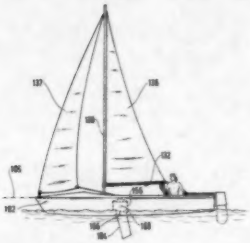
4,377,124

SAILBOAT WITH AN INCLINABLE KEEL BOARD

Franck Guigan, 9, Avenue de Suffren, 75007 Paris, France

Continuation of Ser. No. 30,867, Apr. 17, 1979, abandoned. This application Dec. 16, 1980, Ser. No. 220,231
Claims priority, application France, Apr. 25, 1978, 78 12140; Jan. 5, 1979, 79 00270
Int. Cl.³ B63B *3/38, 41/00*
U.S. Cl. 114—128 **6 Claims**

1. A sailboat with at least one inclinable keel board, said sailboat including:
a hull defining a longitudinal direction which extends between a stern portion and a stem portion;
a keel board which includes a blade which projects beneath the hull to reduce sideways movement of the boat;
a boomed mast on the hull, for carrying sail so that the action of the wind on the sail(s), in conjunction with the action of the water on the blade makes the boat move; and
means for inclining the keel board to allow the blade to incline sideways due to the thrust of the water by rotating through a limited angle about at least one inclination axis which is substantially parallel to the keel blade and above it, so that the transversal component of the movement of the boat generates an upward lift due to the action of the water on the blade,
characterized in that wherein the inclining means includes means to set the axis of inclination of the keel board in such a manner that as the blade rotates about the axis, the axial direction of horizontal cross-sections through the blade are inclined to said longitudinal direction of the boat at an angle such that the forward end of said axial direction moves, with respect to said longitudinal direction, in the same direction as the bottom end of the blade moves with respect to its top end, whereby the longitudinal component of the movement of the boat generates an upward lift component from the blade and whereby the direction of movement of the boat is close to the direction



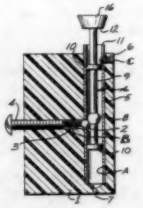
of least resistance to the forward movement of the hull, and wherein said inclining means is such that the inclination axis of the blade is disposed in a vertical longitudinal plane of the boat and is inclined with respect to the horizontal rising towards the bow of the boat so that the axial direction of horizontal cross-sections through the blade are inclined with respect to the longitudinal direction only when the blade is inclined outside the vertical plane of the inclination axis, and wherein inclination of the blade is directly caused by the pressure of the water and is around an inclination axis extending substantially above the blade.

4,377,125

SWING SPEED ANALYZER

Leonard J. Westfall, 5848 Gareau Dr., North Olmsted, Ohio 44070

Filed Jun. 15, 1981, Ser. No. 273,574
Int. Cl.³ A63B *69/36*
U.S. Cl. 116—67 R **9 Claims**



7. A device for indicating the velocity of shaft-type athletic equipment such as a golf club, baseball bat, tennis racket and the like comprising an elongate body having a first bore extending longitudinally therethrough, a metal tube disposed in said bore and having one end projecting outwardly from one end of said bore, a plunger movably disposed in said tube, said plunger being rod-like in general configuration, the outer surface being in inwardly spaced relation to the wall of the tube and having a bulbous portion intermediate its ends, a bearing surface disposed on opposite sides of said bulbous portion being of sufficient lateral dimension relative to the axis of the plunger to slidably engage the wall of said tube as said plunger moves therethrough, one end of said plunger project-

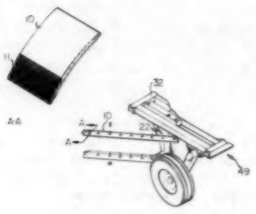
ing outwardly from said one end of said tube and having a cap formed thereon, a second bore formed in said body extending transversely to the first bore and opening into the latter, a ball disposed in said second bore, spring means disposed in said second bore having one end engaging said ball, adjustment means disposed in said second bore having one end in engagement with the remaining end of the spring means effective to urge the ball into pressure engagement with the plunger approximately adjacent the end of the bulbous portion remote from said plunger cap, means to detachably mount said body onto the shaft of the athletic equipment, said shaft being adapted to be swung by the player in normal manner and if said swing has sufficient velocity and power the plunger tends to move through said bore against the pressure exerted thereon by said ball until the pressure of said spring means is overcome to permit said plunger to then rapidly move in a striking direction through said bore, said bulbous portion being of such configuration to effect a reversal of force acting on said plunger by the spring means and ball whereby said reversal of force assists or accelerates the movement of the plunger in said striking direction such that the cap strikes the projecting end of the tube with sufficient force to emit an audible sound or click.

4,377,126

HARD FACING MACHINE

Kenneth G. Lenton, Lethbridge, Canada, assignor to Versatile Cornat Corporation, Vancouver, Canada

Filed Mar. 25, 1981, Ser. No. 247,505
Int. Cl.³ B05C *11/00*
U.S. Cl. 118—47 **12 Claims**



1. A hard facing apparatus for depositing a metal layer on blade material comprising feed means to continuously feed said blade material to a metal deposition area, drive means to move said blade material through said metal deposition area and tension means to drive said blade material while in said feed means, said feed means comprising infeed support rollers mounted to a feed table to guide and support said blade material, said feed table having one end pivotable about a substantially vertical axis adjacent said metal deposition area, and metal depositing means at said metal deposition area continuously depositing said metal layer on said blade material.

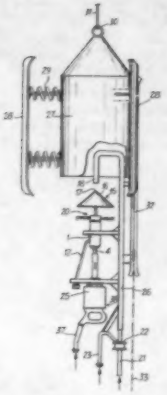
4,377,127

DEVICE FOR PROJECTING A WALL COATING, PARTICULARLY FOR AN EXCAVATION

Lucien Tinchon, Petite Rosselle, France, assignor to Houilleres Du Bassin de Lorraine, Freyming-Merlebach, France

Filed Jan. 28, 1981, Ser. No. 229,265
Claims priority, application France, Jan. 29, 1980, 80 01861
Int. Cl.³ B05C *7/02*
U.S. Cl. 118—306 **4 Claims**

1. A device for simultaneously projecting a liquid or pasty product and a pulverulent or granulous or fibrous filler to make a reinforced plastic wall coating, comprising a casing, a shaft arranged to rotate freely in said casing, said shaft extending through said casing and having one end outside said casing drivingly connected to a motor means, an opposite end extending from the other side of said casing, a centrifugal projecting means mounted on said opposite end for rotation therewith, a spray device mounted between said casing and said opposite end substantially transversely of said shaft for rotation therewith for projecting the product under pressure, said shaft



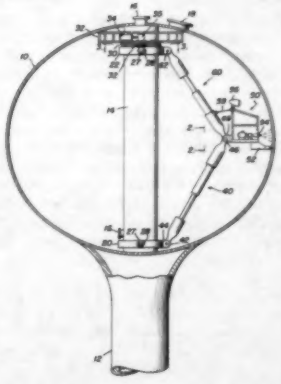
having a central channel in communication with said spray device, said centrifugal projecting means comprising an obtuse cone having an apex directed opposite said spray device, a pipe with a first end opened towards said obtuse cone and a second end in communication with a means for supplying the filler.

4,377,128

APPARATUS FOR INSIDE COATING DOUBLE CURVED SHELL

Luciano F. Bertolazzi, Wheaton, Ill., assignor to Chicago Bridge & Iron Company, Plainfield, Ill.

Filed Feb. 2, 1982, Ser. No. 345,040
Int. Cl.³ B05B *13/06*
U.S. Cl. 118—317 **10 Claims**



1. Apparatus for applying a coating to the inside surface of a double curved shell, comprising:

a work platform for coating equipment;

a first extendable and retractable leg in compression joined at its upper end to the platform and joined at its lower end through a horizontal axis pivot to first means rotatable about a vertical axis on a lower fixed base; and

a second extendable and retractable leg in tension joined at its lower end to the platform and joined at its upper end

through a horizontal axis pivot to means rotatable about a vertical axis on an upper fixed base spaced upwardly from the lower fixed base whereby the lower end of the first leg and the upper end of the second leg can rotate about the same vertical axis.

4,377,129

APPARATUS FOR COATING MOVING STRIPS AND A METHOD FOR PRODUCING THE APPARATUS

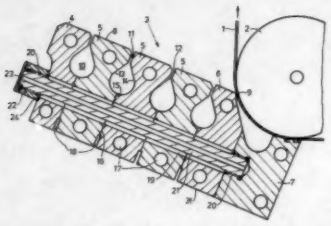
Helmut Glotzbach, Leverkusen, Fed. Rep. of Germany, assignor to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed May 13, 1981, Ser. No. 263,273

Claims priority, application Fed. Rep. of Germany, May 21, 1980, 3019460

Int. Cl.³ B05C *9/06*; B23Q *17/00*; B05C *5/02*

U.S. Cl. 118—412 **7 Claims**



1. Process for joining the profiled parts together to form a coating block for coating moving strips with photographic emulsions and layers, including the steps wherein,

(a) individual parts of a coating block are micro-finished on their inner surfaces before the parts are joined together to form the coating block,

(b) a coating block is formed by joining together the individual parts with contraction anchors having nuts on the contraction anchors which are tightened only to such an extent that the parts can be adjusted in position along their inner surfaces so that their surfaces are smoothly continuous one into the other,

(c) after alignment of the parts, the nuts on the contraction anchors are uniformly tightened with a torque wrench to tension the contraction anchors with a small torque, and the positions of the nuts in relation to the parts are marked,

(d) and then first, every second contraction anchor is heated and the nuts are turned to tighten them further through a previously calculated angle,

(e) after cooling of the first contraction anchors, second the other contraction anchors are heated and their nuts are turned forwards by the same tightening angle, and

(f) to complete the coating block, the flow surfaces for the coating solutions are micro-finished.

4,377,130

ANIMAL ACTUATED FEED AND WATER DISPENSING APPARATUS

Lonny D. Schwieger, Rte. 1, Box 93A, Fairmont, Minn. 56031

Filed Aug. 31, 1981, Ser. No. 298,274

Int. Cl.³ A01K *5/00*, *7/06*

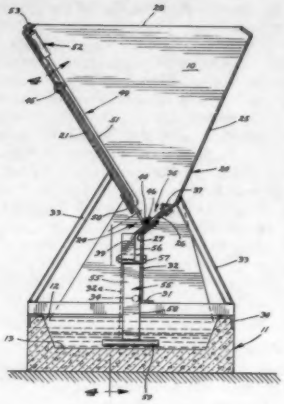
U.S. Cl. 119—51.5 **11 Claims**

1. Hog feeding apparatus comprising, in combination:

a horizontal bunk for receiving feed and water, for access by hogs to be fed;

hopper means having opposite walls with spaced lower edge portions defining an elongate slot therebetween disposed over said bunk so that feed, dispensed through said slot is distributed into said bunk;

feed dispensing means including elongate wing bars overlying the lower edge portion of one of the walls and disposed in said slot and extending longitudinally along the slot, said elongate wing bars being oscillatable transversely in the slot to carry feed thereover to be dispensed, said elongate slot and said feed dispensing means being dimensioned to permit feed to pass through the slot on top of said feed dispensing means only upon oscillation thereof; and



actuating means operably connected to said feed dispensing means to oscillate the wing bars transversely in the slot and including an operator arm extending downwardly into said bunk to be operated by the head of a hog so as to allow the dispensing of adequate feed by the hog without allowing waste by overworking the operator arm.

4,377,131

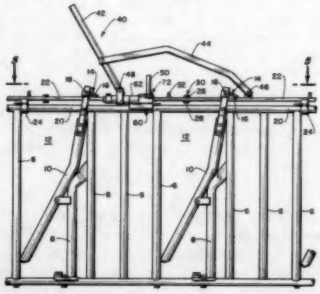
STANCHION CONSTRUCTION

August Vandenberg, 17306 Roseton Ave.; Ben W. Vandenberg, 17226 Roseton Ave., both of Artesia, Calif. 90701; Andrew W. Vandenberg, 15751 Ryon St., and Ben E. Haws, 8828 Laurel St., both of Bellflower, Calif. 90706

Filed May 15, 1981, Ser. No. 263,888

Int. Cl.³ A01K *1/06*

U.S. Cl. 119—148 **13 Claims**



1. In cattle stanchion construction having support structure with spaced pivotal swing pipes defining spaced cattle receiving stations for accommodating cattle in selective captive and non-captive positions, said pivotal swing pipes having latching members for defining said positions, said latching members being pivotally supported from each of said swing pipes and having a depending terminus for a hereinafter defined latch member receiving means, the improvement which comprises: an elongate, annular, pipe member supported for linear move-

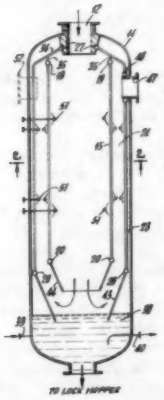
ment from said support structure and extending about the length thereof and having spaced latch member receiving means formed by spaced abutment surfaces on said elongate, annular, pipe member, said spaced abutment surfaces being formed by through bolts and nuts at each of said cattle receiving stations for co-action with said latching members to define said captive positions, said elongate member being radially rotatable relative to said support structure at least a distance to permit disengagement of said latching members with said latch receiving means; and actuator means to linearly and radially actuate said elongate member said actuator means comprising a handle member secured to said elongate, annular pipe member and having a retainer member thereon and being operatively supported to linearly move between a pair of parallel, spaced, plate members having aligned, spaced apentures to captively and releasably receive a pin member to retain said retainer member in a selected position within said parallel, spaced, plate members.

4,377,132

SYNTHESIS GAS COOLER AND WASTE HEAT BOILER

Wolfgang Koog, Pleasantville, and Frank E. Guptill, Jr., Fishkill, both of N.Y., assignors to Texaco Development Corp., White Plains, N.Y.

Filed Feb. 12, 1981, Ser. No. 233,752
Int. Cl.³ F22D *1/00*; C10J *3/48, 3/52*
U.S. Cl. 122—7 R **6 Claims**



1. A synthesis gas cooler and waste heat boiler, comprising

an outer shell having an inlet for said synthesis gas with entrained solids located at the top of said shell,

a gas tight inner water wall for radiant heat exchange from said synthesis gas to water in said water wall,

said inner water wall extending substantially the full length of said cooler

an outer water wall within said shell and forming an annulus between said inner and outer water walls extending said full length

connecting means between said inner and outer water walls at said top for closing said annulus to said synthesis gas flow,

an outlet for said synthesis gas from said annulus at said top,

a body of water at the bottom of said shell for receiving and quenching said entrained solids,

first baffle means connected to said outer water wall at said bottom and extending into said body of water for directing said gas flow into said annulus, and

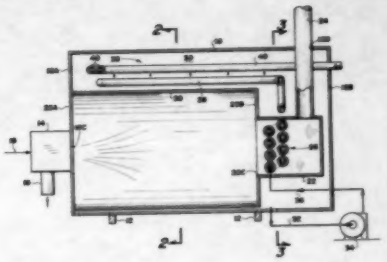
second baffle means connected to said inner water wall at said bottom, said second baffle means extending adjacent to but above the level of said body of water and forming a restricted gas passage accelerating flow of said gas and entrained solids toward the surface of said body of water for reversing the direction of flow to separate said entrained solids with quenching thereof.

4,377,133

CRYOGENIC HEATER

Ajit D. Mankekar, 4920 S. Lewis, #107, Tulsa, Okla. 74105

Continuation of Ser. No. 159,205, Jun. 13, 1980, abandoned. This application Sep. 4, 1981, Ser. No. 299,330
Int. Cl.³ F22B *1/02, 7/00*
U.S. Cl. 122—31 A **5 Claims**



1. Apparatus for heating a confined liquid medium comprising:

a closed vessel having a heat transfer liquid therein;

a burner housing within said vessel at least substantially submerged to said heat transfer liquid;

a burner having a fuel inlet and combustion air inlet, the burner having a flame outlet communicating with the interior of said burner housing;

a flue conduit connected to said burner housing at a point spaced from said burner flame outlet, the flue conduit extending sealably through the vessel wall and communicating with the atmosphere;

a liquid medium heat exchanger in the form of at least one elongated horizontal conduit supported within the upper portion of said vessel externally of said burner housing including inlet and outlet conduits passing sealably through the wall of said vessel;

a transfer liquid heat exchanger within said burner housing intermediate said burner flame outlet and said flue conduit, including at least one inlet and outlet passing sealably through the wall of said burner housing including means of circulating the heat transfer liquid therethrough;

a pump having an inlet and outlet, the inlet having communication with said vessel; and

a sparging tube positioned adjacent, parallel to, and below the liquid medium heat exchanger, the sparging tube being in the form of at least one elongated horizontal perforated tube and being connected to receive and discharge the flow of heat transfer medium from said pump.

4,377,134

STEAM TEMPERATURE CONTROL WITH OVERFIRE AIR FIRING

Donald J. Frey, North Canton, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 3, 1981, Ser. No. 289,674
Int. Cl.³ F22G *5/00*
U.S. Cl. 122—479 B **5 Claims**

1. In a fossil fuel-fired steam generator having an elongated furnace with a gas outlet, steam generating tubes lining the walls of said furnace, a gas exit duct connected to the gas outlet of said furnace for conveying gases therefrom, superheater surface located in said exit duct, and means for conveying steam generated in said steam generating tubes through said superheat surface in heat exchange relationship with the gases

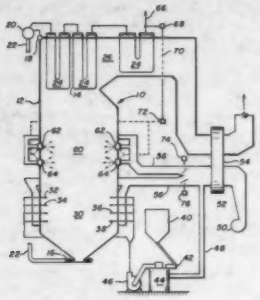
passing through said exit duct; a method of firing said furnace comprising:

a. injecting fuel into said furnace in a first zone remote from the gas outlet of said furnace;

b. introducing a first portion of air into said first zone whereupon combustion of the fuel is initiated;

c. introducing a second portion of air into said furnace in a second zone spaced from said first zone and intermediate said first zone and the gas outlet of said furnace; and

d. regulating the outlet temperature of the steam conveyed through said superheat surface by selectively directing the second portion of air introduced into said furnace toward the gas outlet thereof to increase said temperature and away from the gas outlet thereof to decrease said temperature.



4,377,135

ADDITIVE MEANS FOR AN AIR COMPRESSING INTERNAL COMBUSTION ENGINE

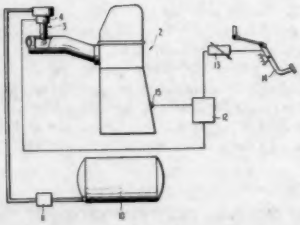
Jörg Abthoff, Plüderhausen; Hans-Dieter Schuster, Schorndorf; Hans-Joachim Langer, Remseck, and Marijan Laszlo, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Nov. 3, 1980, Ser. No. 203,545

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1979, 2944318

Int. Cl.³ F02D *19/00*

U.S. Cl. 123—25 J **10 Claims**



1. An arrangement for supplying an additive to a fuel-injected air compressing internal combustion engine, characterized in that means are arranged at an intake means of the internal combustion engine for feeding the additive into the intake means, and in that means are provided for metering a supply of the additive to the feeding means in response to at least one of a load or rotational speed of the engine, the metering means includes an electrical magnetic valve means operatively connected with the feeding means, the feeding means includes a nozzle needle means for controlling a flow of the additive through the feeding means, means are provided for controlling an opening and closing timing ratio of the electromagnetic valve means in response to signals representing the load of the engine, and in that said electromagnetic valve means is adapted to initially release a volume of the additive as a function of the load of the engine, with an actual volume of the additive being governed as a function of an air velocity at the nozzle needle means of the feeding means.

4,377,136

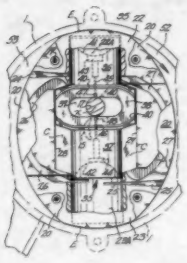
ROTARY PISTON ENGINE

Lyle B. Evans, 9135 SW Summerfield Ct., Tigard, Oreg. 97223

Continuation-in-part of Ser. No. 921,965, Jul. 5, 1978, abandoned. This application May 27, 1980, Ser. No. 153,430

Int. Cl.³ F02B *57/04*

U.S. Cl. 123—44 C **8 Claims**



1. A rotary internal combustion engine comprising,

a fixed casing defining a cylindrical chamber and having fuel intake means and exhaust means in communication with said chamber,

an elliptical rotor assembly for rotation within said casing chamber about an axis and including rotor heads each defining a combustion chamber,

a piston yoke assembly including pistons and an interconnecting yoke portion having side faces and reciprocally mounted within said rotor assembly and rotatable about a second axis offset from the rotor assembly axis, a fuel-air chamber within said rotor assembly within which said yoke reciprocates to alternately pressurize a fuel-air mixture for said combustion chambers, ignition components carried by said rotor assembly, said rotor assembly being of substantially elliptical configuration with rotor assembly ends each having a peripheral surface portion substantially corresponding in curvature to the inner surface of the casing wall and closely adjacent thereto so as to partially define separate exhaust chambers,

said casing having an end plate, said end plate and said rotor assembly jointly defining an area through which fuel and air pass to enter said fuel-air chamber, and

fixed means on said casing in engagement with said yoke portion to constrain same for rotation about said second axis and thereby impart rotational force to the rotor assembly subsequent to ignition of a fuel-air charge in a combustion chamber.

4,377,137

METHOD FOR STARTING THE OPERATION OF AN INTERNAL COMBUSTION ENGINE

Matsuo Amano; Toru Sugawara, both of Hitachi; Yasunori Mouri; Yoshikazu Aochi, both of Katsuta, and Shinichi Sakamoto, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 25, 1980, Ser. No. 210,166

Claims priority, application Japan, Nov. 26, 1979, 54/152039

Int. Cl.³ F02D *29/02*

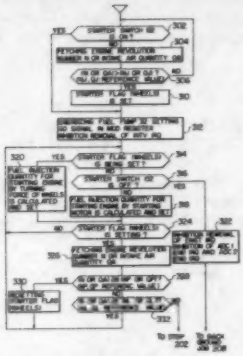
U.S. Cl. 123—179 B **26 Claims**

1. For use in an electronic control apparatus for controlling

the operation of a combustion engine of a motor vehicle having an output shaft for producing an output torque for driving wheels of the vehicle and a starter motor for controllably rotating said output shaft, a method of operating said control apparatus for controlling the starting of said engine comprising the steps of:

(a) detecting whether or not said starter motor is in an energized state;

(b) in response to step (a) detecting that said starter motor is



in an energized state, supplying starting control signals to said engine so that said engine is started thereby;

(c) in response to step (a) detecting that said starter motor is not in an energized state, determining whether prescribed operational characteristics of said engine indicate that said engine is being driven by the wheels of said vehicle; and

(d) in response to step (c) determining that said engine is being drive by the wheels of said vehicle, supplying engine starting control signals to said engine so that said engine is started thereby.

4,377,138

GLOW PLUG CONTROL SYSTEM FOR DIESEL ENGINE

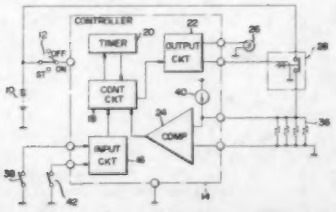
Tateki Mitani, Himeji, and Akira Demizu, Tatsuno, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Chiyodaku, Japan

Filed Mar. 3, 1981, Ser. No. 240,061

Claims priority, application Japan, Mar. 3, 1980, 55-28008[U]

Int. Cl.³ F02N *17/00*

U.S. Cl. 123—179 H **2 Claims**



1. A glow plug control system comprising a group of glow plugs, a timer means, a constant current circuit and a constant voltage circuit for supplying a current to said group of glow plugs, said constant current circuit and said constant voltage circuit controlled by said timer, a sensor means for sensing a magnitude of resistance of said glow plugs due to a change in temperature thereof, and a control means responsive to said magnitude of resistance sensed by said sensor circuit to control a time interval of heating said glow plugs to thereby control temperature thereof, wherein said timer means selectively causes only one of said constant current circuit and said constant voltage circuit to supply current to said group of glow plugs at any time instant.

4,377,139

PUMPING SYSTEMS

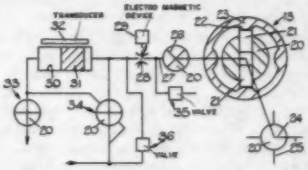
Boaz A. Jarrett, London; Ivor Fenne, Greenford; Dorian F. Mowbray, Burnham, and John E. Mardell, London, all of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Aug. 4, 1980, Ser. No. 174,802

Claims priority, application United Kingdom, Sep. 18, 1979, 7932357

Int. Cl.³ F02B *77/00*; F02M *59/42*

U.S. Cl. 123—358 **5 Claims**



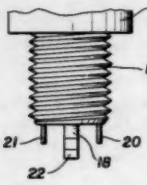
1. A fuel injection pump for supplying fuel to an internal combustion engine comprising a plunger reciprocable within a bore, a cam for imparting inward movement to the plunger to displace fuel from the bore through an outlet, a throttle through which fuel can be supplied to the bore to effect outward movement of the plunger, governor means for adjusting the setting of said throttle whereby the amount of fuel delivered through the outlet can be varied, first valve means communicating with a point intermediate the throttle and the bore, said first valve means when opened lowering the pressure downstream of the throttle to a drain pressure, second valve means for controlling the pressure applied to the outer end of the plunger so that in use, it is maintained at a value which is higher than said drain pressure, the arrangement being that when said first valve means is opened the plunger will be moved inwardly by the pressure at its outer end, by an amount to ensure that it cannot be actuated by the cam, circuit means for controlling the operation of said first valve means, said circuit means receiving a fuel demand signal from said governor means and an engine speed signal, said circuit means operating to open said first valve means when the fuel demand signal is zero and the engine speed is above a predetermined value, said circuit means being arranged to cause closure of said first valve means when the speed falls to said predetermined value and if the governor means provides a fuel demand signal, and further circuit means operable to effect momentary opening of said throttle when the demand is zero and the engine speed has fallen to a further predetermined value less than said first mentioned predetermined value to prime the passages of the pump including the bore, and to move the plunger outwardly by an amount so that when said governor means provides a fuel demand signal to open the throttle, fuel will immediately be supplied by the pump.

4,377,140

METHOD AND APPARATUS FOR CLOSED-LOOP IGNITION TIME CONTROL

Reinhard Latsch, Vaihingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Fed. Rep. of Germany

Filed Sep. 29, 1980, Ser. No. 191,749
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1979, 2939690
Int. Cl.³ F02P 5/04
U.S. Cl. 123—415 17 Claims



1. A method for controlling the instant of ignition in closed-loop fashion in an internal combustion engine, comprising the steps of:

detecting the ionic current released during combustion of the operational mixture at a predetermined distance from the point of ignition in a combustion chamber of the engine, where the flame front reaching said distance has ignited a mixture volume less than 5% of the total volume;

generating an actual value signal from the ionic current, representing the end of the ignition phase of the operational mixture;

generating a set-point value signal before top dead center as a function of crankshaft angle, representing a desired end of the ignition phase of the operational mixture;

comparing the actual value signal to the set-point value signal and generating a difference signal; and

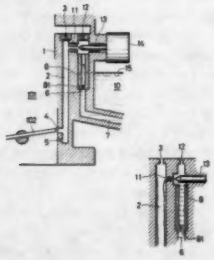
correcting the instant of ignition in the combustion chamber of the engine as a function of the difference signal.

4,377,141

LOW SPEED FUEL SUPPLY SYSTEM FOR A CARBURETOR

Kimiji Karino, and Tokuo Kosuge, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 30, 1981, Ser. No. 288,497
Claims priority, application Japan, Jul. 30, 1980, 55-104665
Int. Cl.³ F02M 3/08, 13/04, 1/10
U.S. Cl. 123—438 17 Claims



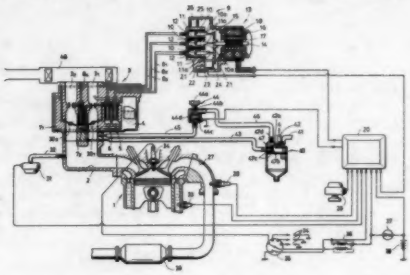
1. A low speed fuel supply system for a carburetor, characterized in that an induction passage means is provided for supplying a fuel-air mixture to an engine, a throttle valve means is rotatably mounted in the induction passage means for controlling the air fuel flow through the induction passage means, an ascending fuel passage means has a lower end communicating with a fuel supply means, a fuel-air passage means has an upper end portion connected to an upper end portion of the ascending fuel passage means and a lower end portion connected to the induction passage means in a vicinity of the throttle valve means, means are disposed in the ascending fuel passage means for directing fuel ascending from the fuel supply means in the ascending fuel passage means to the fuel-air passage means, and in that means are provided for introducing air into the upper end portion of the ascending fuel passage means so that the air flows mainly along an upper portion of the fuel directing means, whereby the fuel and air flows are divided into two layers at the upper portion of the ascending fuel passage means.

4,377,142

AIR/FUEL RATIO CONTROL SYSTEM HAVING AN EVAPORATED FUEL PURGING CONTROL ARRANGEMENT

Kazuo Otsuka, Higashikurume; Shin Narasaka, Yono, and Shumpei Hasegawa, Niiza, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 25, 1981, Ser. No. 296,203
Claims priority, application Japan, Aug. 28, 1980, 55-119115
Int. Cl.³ F02M 7/24, 33/02
U.S. Cl. 123—440 2 Claims



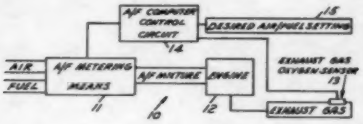
1. In an air/fuel ratio control system for performing feedback control of the air/fuel ratio of an air/fuel mixture being supplied to an internal combustion engine having an intake pipe, said system including means for detecting the concentration of an exhaust gas ingredient emitted from said engine, fuel quantity adjusting means for producing said mixture being supplied to said engine, and an electrical circuit operatively connecting said concentration detecting means with said fuel quantity adjusting means in a manner effecting feedback control operation to control the air/fuel ratio of said mixture to a predetermined value in response to an output signal produced by said concentration detecting means, the combination comprising: a canister having evaporated fuel absorbed therein; a purge conduit connecting said canister to said intake pipe of said engine for allowing said fuel absorbed in said canister to be purged into said intake pipe; a purge control valve having means actuatable by negative pressure and arranged across said purge conduit; a control circuit connecting said negative pressure-actuatable means of said purge control valve to said intake pipe; a solenoid valve arranged to selectively close and open said control conduit; means for driving said solenoid valve; a temperature sensor responsive to a change in the temperature of engine coolant to produce an output continuously variable with said change; and circuit means provided within said electrical circuit and operable to detect an operating condition of said engine; said circuit means being connected to said temperature sensor to be supplied with said output of said temperature sensor; said electrical circuit being operable to carry out control of the air/fuel ratio of said mixture in response to said output of said temperature sensor supplied to said circuit means; said circuit means being connected to said solenoid

valve driving means and adapted to supply a control signal thereto when said output of said temperature sensor exceeds a predetermined value; said solenoid valve driving means being operable upon said control signal to actuate said solenoid valve to cause said negative pressure-actuatable means of said purge control valve to communicate with atmospheric air.

4,377,143
LEAN AIR-FUEL CONTROL USING STOICHIOMETRIC AIR-FUEL SENSORS

Douglas R. Hamburg, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 20, 1980, Ser. No. 208,764
Int. Cl.³ F02B *33/00, 3/00*
U.S. Cl. 123—440 **14 Claims**



1. An air-fuel ratio control means for an internal combustion engine, said air-fuel ratio control means including:

stoichiometric sensing means for providing an output in response to a stoichiometric condition so that it can be determined whether an air-fuel ratio is rich or lean of stoichiometry;

reference means for providing a desired air-fuel ratio;

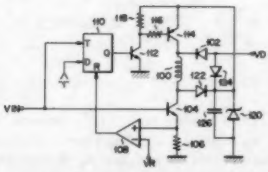
fuel metering means which is electronically controllable for injecting a given amount of fuel; and

adjustment means for pulsing a base air-fuel ratio, comparing the resulting perturbed air-fuel ratio with a stoichiometric ratio, and for changing the base air-fuel ratio so that the next perturbation produces less of a change from stoichiometry thus permitting the base air-fuel ratio to be maintained at an offset from stoichiometry.

4,377,144
INJECTOR DRIVING CIRCUIT

Yukiharu Takahashi, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 3, 1981, Ser. No. 299,135
Claims priority, application Japan, Sep. 8, 1980, 55-124241
Int. Cl.³ F02B *3/00*; F02M *7/00*
U.S. Cl. 123—490 **10 Claims**



1. An injector driving circuit comprising:

a power supply voltage terminal and a reference voltage terminal;

a first diode circuit coupled between one end of a solenoid coil of an injector to be driven and said power supply voltage terminal to supply said one end of said solenoid coil with a power supply voltage applied to said power supply voltage terminal;

first switching means coupled between the other end of said solenoid coil and said reference voltage terminal to control the current conducting state of said solenoid coil in accordance with a driving input signal;

current detecting means producing an output signal when detecting that current flowing through said solenoid coil has reached a predetermined value;

charge storing means with one end coupled to said reference voltage terminal;

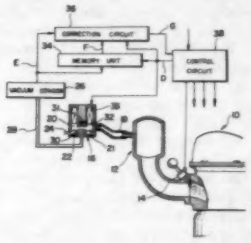
second switching means coupled between said one end of said solenoid coil and the other end of said charge storing means and connected to be turned on and off in resonse to the driving input signal and the output signal from said current detecting means, respectively; and

a second diode circuit coupled between said other end of said solenoid coil and said other end of said charge storing means to allow current to flow from said solenoid coil to said charge storing means.

4,377,145
INTAKE VACUUM SENSING SYSTEM WITH CORRECTION DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Hatsuo Nagaishi, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 24, 1980, Ser. No. 190,294
Claims priority, application Japan, Sep. 27, 1979, 54-133584[U]
Int. Cl.³ F02M *51/00*
U.S. Cl. 123—494 **8 Claims**



1. An intake vacuum sensing system for an internal combustion engine comprising:

a vacuum sensor connected with an intake manifold of the internal combustion engine and adapted to produce a sensor signal having a signal value proportional to the vacuum pressure in the intake manifold;

a switching valve means interposed between said vacuum sensor and said intake manifold and in communication with the atmosphere for selectively introducing either the intake vacuum or atmospheric air into said vacuum sensor, which switching valve means is responsive to a correction command to introduce atmospheric air for a predetermined period of time;

a correction command generator cyclically generating said correction command to be fed to said switching valve means, which correction command generator is responsive to the turning on of an engine starter switch to produce the first correction command;

a memory unit operative in response to said correction command to store a sensor signal value representative of atmospheric air pressure, which memory unit is responsive to said first correction command to store the sensor signal value as a memory value and is responsive to a trailing correction command for updating said memory value with the sensor signal value;

a correcting means responsive to said correction command to compare the sensor signal value with said memory value stored in said memory means, and for determining the difference therebetween, said correction means cor-

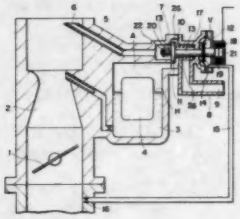
recting the sensor signal value indicative of detected intake vacuum pressure based on the determined difference.

4,377,146

VAPORIZED FUEL CONTROLLER FOR A CARBURETOR

Tetsuya Oniki, Anjyo, and Kunio Kadowaki, Obbu, both of Japan, assignors to Aisan Industry Co., Ltd., Aichi, Japan

Filed Apr. 4, 1980, Ser. No. 137,156
Claims priority, application Japan, May 2, 1979, 54/59226[U]
Int. Cl.³ F02M *33/02*
U.S. Cl. 123—520 **8 Claims**



1. In an engine a vaporized fuel controller for a carburetor having a vapor fuel exhaust passage communicating with a gas chamber of a float chamber, and two passages via openings thereof, respectively, communicating with said exhaust passage, one of said two passages communicating with an inner vent and the other of said two passages communicating with a canister, the improvement wherein

said openings of said two passages opposing each other across said exhaust passage,

means comprising a changeover valve between said openings of said two passages for alternately opening and closing said openings, said valve having a valve stem and a valve disc operatively freely slidable along said valve stem and springs acting on surfaces of said valve disc,

a negative pressure valve and an electromagnet both operatively acting on said changeover valve in such a manner that via said valve disc the opening to said one of said two passages on the inner vent side is opened while the engine is running, and the opening to said other of said two passages on the canister side is opened while the engine is stopped, such that function is relative to the operation of the engine,

said openings oppose each other squarely aligned across said exhaust passage,

said valve stem extends through said openings and has a free end on which one of said springs is mounted, said one of said springs and the other of said springs engage opposite of said surfaces of said valve disc, and

said negative pressure valve is connected to another end of said valve stem and to said electromagnet.

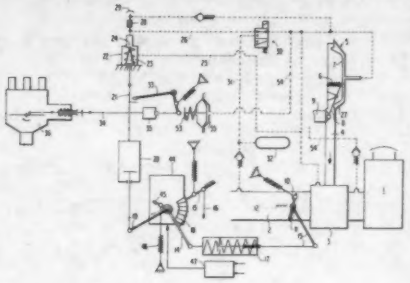
4,377,147

INTERNAL COMBUSTION ENGINE

Horst Bergmann, Esslingen; Hans Pracht, Weinstadt, and Klaus-Dieter Holloh, Kernen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 8, 1981, Ser. No. 299,926
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1980, 3033386
Int. Cl.³ F02B *43/00*; F02M *21/04*
U.S. Cl. 123—527 **23 Claims**

1. An internal combustion engine powered by a gaseous fuel, the engine comprising air intake means, an air-fuel mixer means arranged in the air intake means, a fuel pressure regulator means for controlling a flow of fuel to the mixer means, throttle valve means actuatable by an accelerator means arranged in the intake means downstream of the air-fuel mixer means, and means for regulating a quantity of fuel supplied to the engine during a low load operation of the engine and for regulating a quality of fuel during an upper load range of operation of the engine, characterized in that the means for regulating the quantity and quality of fuel includes a control line means branching off from the air intakemeans at a position upstream of the throttle valve means and adapted to be subjected to the



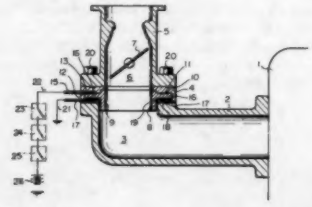
vacuum prevailing at that position of the air intake means, a control valve means arranged in the control line means for controlling the fuel pressure regulator means, means for connecting the accelerator means with the control valve means for controlling a through-flow cross section of the control valve means in a direct relationship to a position of the accelerator means, and means for venting the control line means to outside air.

4,377,148

FUEL MIXTURE HEATING DEVICE OF AN INTERNAL COMBUSTION ENGINE

Yasuhiko Ishida, Mishima, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 16, 1980, Ser. No. 217,188
Claims priority, application Japan, Jan. 7, 1980, 55-000018[U]
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—549 **17 Claims**



1. A fuel mixture heating device of an internal combustion engine having an intake manifold and an intake passage which has an outlet connected to a collecting portion of the intake manifold, the intake passage having a fuel feed apparatus for feeding fuel into the intake passage, said device comprising:

a power source;

a hollow cylindrical body arranged at the outlet of the intake passage and aligned with the intake passage, said hollow cylindrical body having a substantially cylindrical inner wall and an outer wall which has a radially outwardly extending flange formed in one piece thereon, and;

a heater arranged on said flange and connected to said power source, wherein said heater comprises at least one PTC element arranged on said flange, and wherein said

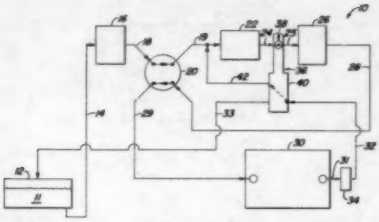
flange has a flat wall, and said PTC element has a generally flat shape and a flat face which is in contact with said flat wall.

4,377,149

FUEL TEMPERATURE CONTROL SYSTEM

Jimmy C. Naylor, and Richard G. Norton, both of Hudson, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Oct. 14, 1980, Ser. No. 196,511
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—557 **9 Claims**



1. An improved fuel temperature control system for attachment to a diesel engine which comprises:

(a) a fuel tank capable of holding a fuel;

(b) an injection pump capable of supplying said fuel to each cylinder of said diesel engine, said injection pump having a gallery mechanism which limits the amount of said fuel which is supplied to each cylinder;

(c) a fuel supply line connecting said fuel tank to said injection pump;

(d) a transfer pump positioned across said fuel supply line capable of drawing said fuel out of said fuel tank;

(e) a fuel return line connecting said injection pump to said fuel tank for routing unused fuel back to said fuel tank;

(f) a check valve positioned across said fuel return line for preventing said unused fuel from flowing back into said injection pump;

(g) a shut-off valve positioned across said fuel supply line and operable to conduct fuel from said fuel tank via said transfer pump to said injection pump when said engine is running and to conduct fuel from said injection pump via said transfer pump to said fuel tank when said engine is stopped;

(h) temperature control means positioned across said fuel supply line between said transfer pump and said injection pump, said temperature control means comprising a temperature sensor interconnected to a fluid control valve, said temperature sensor capable of sensing the temperature of said fuel flowing in said fuel supply line and said fluid control valve capable of altering the direction of flow of said unused fuel in said fuel return line; and

(i) a fuel bypass line connecting said fluid control valve to said fuel supply line upstream of said transfer pump, said fuel bypass line capable of routing said unused fuel from said fluid control valve to said fuel supply line for warming up said fuel flowing to said injection pump.

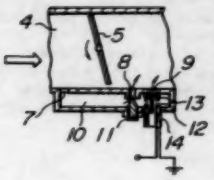
4,377,150

APPARATUS FOR ASSISTING ENGINE STARTING

Hidetoshi Kitamura, and Takeo Oyama, both of Tokyo, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 18, 1980, Ser. No. 141,697
Claims priority, application Japan, Apr. 23, 1979, 54-53362[U]
Int. Cl.³ F02M *23/00*
U.S. Cl. 123—588 **4 Claims**

1. An apparatus for assisting a hot-restarting operation of an internal combustion engine comprising a main air passage, a throttle valve inserted into the main air passage, a by-pass air passage by-passing the throttle valve, an engine starting switch, first means to detect the engine temperature, second means to detect ambient air temperature, and an auxiliary air introducing means inserted into the by-pass air passage and controlled by the engine starting switch and said temperature detecting means, the auxiliary air introducing means being a



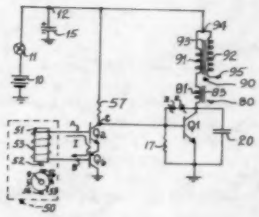
single valve having a control circuit therefor in which the first and second detecting means are connected in series with each other, and arranged such that air flow resistance through the by-pass air passage is reduced during the hot-starting operation of the engine under a condition in which the engine temperature and/or ambient air temperature are above respectively predetermined temperatures.

4,377,151

BIPOLAR ACTIVATED MAGNETIC PULSE TIMER

Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705

Continuation-in-part of Ser. No. 282,755, Jul. 13, 1981, and Ser. No. 336,506, Dec. 31, 1981. This application Apr. 7, 1982, Ser. No. 366,222
Int. Cl.³ F02P *1/00*
U.S. Cl. 123—618 **6 Claims**



1. A bipolar activated magnetic pulse timer for an ignition system of a fuel burning engine, comprising the combination of:

a pair of semiconductor switches of opposite conductivities, each of said switches having an input and an output circuit, the output circuits of said switches being serially connected; and

a magnetic pulse timer having an output winding, said output winding being connected to the input circuits of said switches.

4,377,152

CABLE GUARD FOR COMPOUND BOW

Charles A. Saunders, Columbus, Nebr., assignor to Saunders Archery Co., Columbus, Nebr.

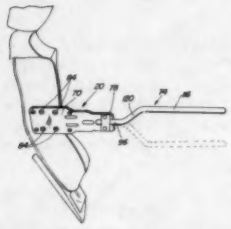
Filed Sep. 16, 1981, Ser. No. 302,737
Int. Cl.³ F41B *5/00*
U.S. Cl. 124—88 **5 Claims**

1. In a cable guard for use with a compound archery bow and including a bow-handle-mounting bracket and cable guard rod means carried thereby, said rod means being adapted for

engaging and deflecting cable strands of the compound bow physically to prevent interfering contact of the cable strands with an arrow during impelling flight of the arrow from the bow and obviating impairment of true flight of an arrow released from the bow,

said mounting bracket including means for supporting said cable guard rod means in stable relationship therewith to extend essentially transversely of the cable strands and proximate thereto,

the improvement comprising rod adjustment means for selectively regulating the extent to which said cable guard rod means deflects the cable strands through controlled displacement of the strands from an arrow show movement path delineated by a zone established by an arrow nocked on a bowstring of a compound bow and readied for a shooting sequence,



said adjustment means comprising an intermediate lineal segment of said rod means joined to and interposed between a freely extending section of said rod means and a bracket-secured section of said rod means held by said mounting bracket,

said intermediate lineal segment of said rod means comprising offset means for establishing distinct but essentially parallel longitudinally extending axes of rotation for said freely extending section and for said secured section of said rod means,

said bracket means clamping said rod means for selective rotational positioning to render a rotational axis of said freely extending section of said rod means eccentric with respect to a longitudinal axis of said secured section of said rod means, thereby to permit selectable degrees of lateral displacement of the cable strands as said freely extending section of said rod means is brought to bear against and shift the cable strands from an arrow flight zone.

4,377,153

HEATING DEVICE

Rodger H. Flagg, 1415 Lynn Ave., Ft. Wayne, Ind. 46805

Filed Apr. 1, 1981, Ser. No. 250,008

Int. Cl.³ F23L *13/00*

U.S. Cl. 126—285 R **21 Claims**

1. A heating device adapted to burn a combustionable fuel in a room, which comprises:

an outer shell having a top, a bottom, and depending sides therebetween;

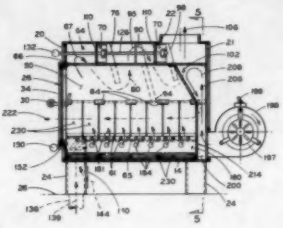
an inner shell having a top and depending sides, said inner shell adapted to be installed within said outer shell in spaced relation to provide an exhaust chamber therebetween extending across the top and at least partially down a side between said inner and outer shells;

an access aperture through a side of the heating device of a size sufficient to allow placement of a combustionable fuel within said inner shell;

a grate with a plurality of apertures therethrough adapted to substantially extend in spaced relation above the bottom of said outer shell to receive said fuel thereon, forming a combustion chamber between said grate and said inner shell, a portion of the top of said combustion chamber adapted to be in fluid communication with said exhaust chamber;

an exhaust port adapted to exhaust combustion gasses from the exhaust chamber through the exhaust port beyond the heating device into a suitable fluid duct to atmosphere;

a baffle in said exhaust chamber between the inner and outer shells, said baffle adapted to extend partially down a side in spaced relation between said inner and outer shells;



a damper positioned within the exhaust chamber and adapted to be adjustably positioned to provide through passage of combustion gasses from the combustion chamber through the exhaust chamber to the exhaust port; said damper adapted to be adjustably positioned to substantially divert combustion gasses in the exhaust chamber downwardly along said baffle within the exhaust chamber to extend the distance travelled by the combustion gasses prior to exiting from the exhaust chamber through the exhaust port.

4,377,154

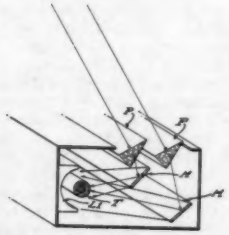
PRISMATIC TRACKING INSOLATION

Milton Meckler, 16348 Tupper St., Sepulvada, Calif. 91348

Continuation-in-part of Ser. No. 30,328, Apr. 16, 1979, abandoned. This application Jun. 9, 1981, Ser. No. 271,837

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—425 **9 Claims**



1. A concentrating tracking insolation collector for operation in a plane substantially normal to the altitude traverse of the sun, and including;

an elongated prism of acute apex angle rotatably mounted on a rotational axis disposed in said plane for tracking the altitude of the sun and for maintaining said acute apex angle away from the zenith position of the sun,

the prism being reversible and having divergent faces used alternately for the reception and transmission of sun rays and dispersion thereof along a first mean plane respectively,

an elongated mirror coextensive with and rotatably mounted on an axis disposed on said first mean plane to reflect the incoming sun rays from the prism and along a second mean plane and to a target focus line,

an elongated lens means on said second mean plane between the mirror and the said target focus line,

a clock drive means comprising operating means to maintain the said reception face of the prism substantially normal to the incoming sun rays and the transmission of light therefrom along said first mean plane, operating means to maintain the said acute apex angle of the prism away from the zenith position of the sun, and operating means to rotatably position the mirror to reflect along said second mean plane and onto said target focus line,

and an elongated insolation responsive target coextensive with said prism and said mirror and disposed on the focus line and spaced from and parallel to the axes of prism and mirror rotation.

4,377,155

SOLAR ENERGY COLLECTOR ASSEMBLY

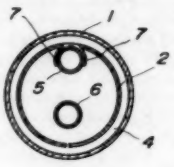
Toshiya Tonomura, Nara, and Saburo Nishiuma, Kashihara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

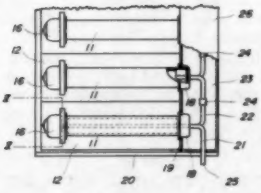
Filed Jun. 13, 1979, Ser. No. 48,254

Claims priority, application Japan, Jun. 13, 1978, 53-71939; Jun. 20, 1978, 53-89004

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—443 19 Claims





1. A solar energy collector apparatus comprising:

(a) a tubular collector means comprising in combination:

an evacuated tubular housing having a cylindrical shape;

a solar energy metal absorber member comprising a hollow elongated metal sheet disposed within said tubular housing substantially co-axial to said tubular housing, and having an outer diameter smaller than the inner diameter of said tubular housing for defining an annular space therebetween;

means for maintaining said annular space;

an absorbing media-containing metal conduit means disposed for contact with at least a portion of the solar energy absorber member, thereby maintaining the absorbing media contained in said metal conduit in good heat transfer relationship with said solar energy absorber member; and

(b) a reflector means having a concave reflecting surface facing one side of said tubular collector means.

4,377,156

SOLAR COLLECTORS AND PROCESS FOR THE MANUFACTURE THEREOF

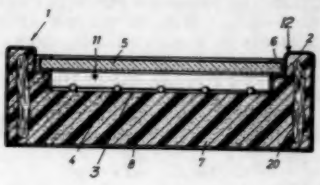
Manfred Scheizig, Ziegler Strasse 6, 8900 Augsburg 22, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 890,915, Mar. 28, 1978, abandoned. This application Mar. 23, 1979, Ser. No. 23,266

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1977, 2713628

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—450 26 Claims



1. A molded solar collector carrier comprising a rigid-cellular polyurethane foam filling body coated with a tight sealing polyurethane top layer, having a density and rigidity greater than said filling body, said top layer being formed from a mixture of multifunctional polyether alcohols with a combination of non-light resistant and light resistant aliphatic polyisocyanate compositions, said aliphatic polyisocyanates being distributed in said mixture so that the inner surface is formed non-light resistant and the outer surface is light-resistant, said top layer being the supporting component of said carrier and being integrally bonded with said filling body by chemical cross-linkage means.

4,377,157

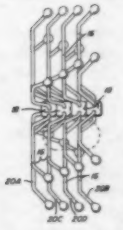
INTRAVAGINAL ANCHORING DEVICE

David L. Zartman, Las Cruces, N. Mex., assignor to New Mexico State University Foundation, Inc., Las Cruces, N. Mex.

Filed Oct. 6, 1980, Ser. No. 194,583

Int. Cl.³ A61B *19/00*

U.S. Cl. 128—1 R 4 Claims



1. In a device for intravaginal implantation in mammalian females which includes an axially-extending hub having an anterior end and a posterior end and being encircled by a ring having a plurality of radially-extending springable spine-like fingers thereon, said ring cooperating with said hub to define a multi-pointed star, an improvement consisting of an anterior star having a ring located substantially flush with said hub anterior end and a posterior star having a ring located substantially flush with said hub posterior end, said posterior star being in axially-spaced relation to said anterior star to leave a section of said hub exposed between said stars, the fingers of both stars being shaped to spring forwardly into folded relation in response to a radially-directed pressure exerted upon the

ends thereof remote from the hub, and the length of the fingers on the posterior star in relation to said exposed hub section being such that when the posterior star fingers are sprung forwardly into folded relation along the exposed hub section said fingers overlie the exposed length of said hub and are effective to prevent engagement between the exposed hub section and the vaginal musculature.

4,377,158

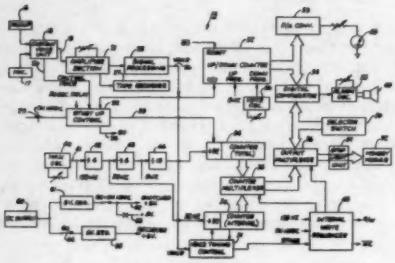
METHOD AND MONITOR FOR VOICE FLUENCY

Ernest H. Friedman, 1831 Forest Hills Blvd., Cleveland, Ohio 44112; Charles N. Flammer, Brighton, Mass.; Daniel A. Baker, St. Joseph, Mich., and Spiro Vamvakas, Rocky River, Ohio, assignors to Ernest H. Friedman, East Cleveland, Ohio

Division of Ser. No. 35,394, May 2, 1979, Pat. No. 4,278,096, which is a continuation-in-part of Ser. No. 851,285, Nov. 14, 1977, Pat. No. 4,156,423. This application Feb. 2, 1981, Ser. No. 230,725

Int. Cl.³ A61B *1/00*

U.S. Cl. 128—1 R **16 Claims**



1. A voice fluency monitor to determine the fluency of uttered speech of a human subject during a dialogue with another person comprising in combination,

first transducer means connected to be responsive to the voice of a subject,

second transducer means connected to be responsive to the voice of a person with whom the subject may have a dialogue,

switch means, pause means connected through said switch means to said transducer means to determine hesitation pauses of joint silence of both persons bounded by vocal sounds uttered by the subject which pauses are in excess of a time interval in the order of one second of time,

counter means connected to said pause means for determining the number of such hesitation pauses in a period of time of speech of the subject, and

indicator means connected to said counter means and having an output upon the rate of such hesitation pauses being in excess of a rate in the order of two pauses per minute.

4,377,159

PRESSURE BANDAGES AND METHODS FOR MAKING THE SAME

Paul E. Hansen, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 29, 1981, Ser. No. 278,067

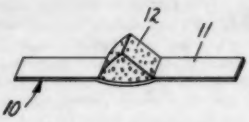
Int. Cl.³ A61F *13/00*

U.S. Cl. 128—155 **14 Claims**

1. A pressure bandage comprising:

(a) a carrier tape comprising a backing and a layer of pressure-sensitive adhesive on one surface of said backing; and

(b) a substantially rectangular prism-shaped section of compressible, resilient material having two adjacent faces attached to said carrier tape by said pressure-sensitive



adhesive such that said section of said material assumes a substantially triangular prism shape.

4,377,160

COMPRESSION BANDAGE

John W. Romaine, 58897 County Rd. 115, Goshen, Ind. 46526

Filed Dec. 19, 1980, Ser. No. 218,380

Int. Cl.³ A61L *15/00*

U.S. Cl. 128—156 **16 Claims**

1. A compression bandage for minimizing swelling caused by contusion of a body part of a human or animal subject, comprising: an elongated, flexible, self-supporting, self-adhereable strip adapted to be wound around the body part in direct surface-to-surface contact with the skin in order to form a multiple convolution compression bandage for compressing the body part and cooling same, said strip being of a length sufficient to permit the bandage to be wrapped totally around the body part with the adjacent convolutions of the bandage being overlapped and adhered to one another so that the bandage will remain wrapped around the body part, said strip consisting essentially of an elongated, thin, substantially planar, flexible, permeable substrate which is impregnated and filled with a gel, said gel consisting essentially of gelled polyvinyl alcohol containing occluded water so that the gel is substantially self-supporting and has a solidlike consistency, said gel being formed by impregnating said substrate with an aqueous solution containing from about 4 to 8 weight percent of polyvinyl alcohol and the balance being essentially water, said polyvinyl alcohol being coagulated with a coagulating agent to insolubilize said polyvinyl alcohol and trap the water therein, said gel being capable of adhering to itself and not being capable of adhering strongly to the skin of the subject, said gel extending to the opposite surfaces of said substrate so that said strip is pressure-sensitive and will adhere to itself and said gel does not strongly adhere to the surface of the skin of the body part so that said strip can easily be unwound and removed from the body part without leaving a significant amount of residue thereon.

4,377,161

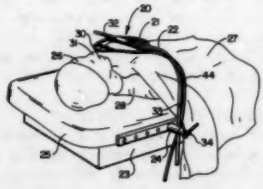
SURGICAL BREATHING APPARATUS

Everett D. Whitt, 3504 Rivercrest Dr., Columbus, Ohio 43223

Filed Jun. 15, 1981, Ser. No. 273,500

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—200.24 **6 Claims**



1. An apparatus to assist patient breathing during surgical procedures on an operating table comprising:

(a) a frame of hollow members having a lateral member

connected to surrounding perimeter members, the perimeter members formed into a rectangle-like configuration having rounded corners with said lateral member being connected between two opposing diagonal corners and one of the remaining corners defining a head end portion adapted to overlie the nose of the patient and project generally in a plane parallel to the surface of the face and torso of the patient on the operating table, the surrounding hollow members being formed as an enclosed conduit having at least one inlet aperture for the admission of breathing gas and at least one outlet aperture in the head end portion; and

(b) a support member adjustably connected to the frame and having clamping means to support the apparatus on the operating table.

4,377,162

FACIAL PROTECTIVE DEVICE, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Peter J. Staver, 1624 Detroit St., Lincoln Park, Mich. 48146

Filed Nov. 26, 1980, Ser. No. 210,740

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—200.28 **2 Claims**

1. A protective device and breathing mask for use in opthalmic surgery comprising:

a base formed generally in conformity with the bridge of a prospective patient's nose adjacent the zygomatic arch;

a ridge extending from said base substantially centrally thereof;

a pair of side panels extending from said base respectively on opposite sides of and structurally connected to said ridge and substantially forming two sides of a protective nose cover;

a fluid plenum chamber within said device spaced substantially from said base;

said plenum chamber being positioned approximately midway along said ridge;

means for admitting air to said chamber;

said chamber having outlets directed substantially downwardly from said ridge;

means, operatively cooperating with said side panels, for removably securing said device to the face of a patient;

said device having a greater dimension in a direction outwardly away from the face of a patient than in the longitudinal direction of the patient's face when said device is operably disposed on the patient; and

said device being disposed substantially out of proximity with the eyes of the patient when said device is operably disposed on the patient.

4,377,163

BREATHING APPARATUS

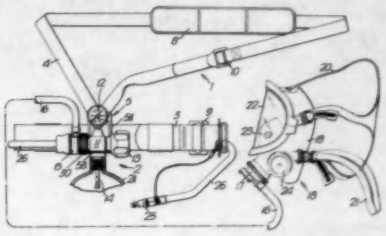
Leonard J. Feathers, Henfield, England, assignor to Clubb Panorama Limited, Sussex, England

Filed Dec. 1, 1980, Ser. No. 211,971

Claims priority, application United Kingdom, Nov. 30, 1979, 7941338

Int. Cl.³ A62B *7/00*

U.S. Cl. 128—205.22 **11 Claims**



1. Breathing apparatus including a cylinder assembly; means defining a breathing circuit connected to the cylinder assembly to lead breathing gas from said assembly to a user; a harness; a mounting member secured to the harness through which the cylinder assembly is supported; and fastening means co-operable with the cylinder assembly; said mounting member and the cylinder assembly having complementary formations comprising respectively a planar portion with an open-ended slot and an externally grooved portion, whereby said formations can be engaged by inserting said grooved portion into said slot with opposing flanks of the grooved portion lying on opposite faces of said planar portion; said fastening means including means to resist the withdrawal of said grooved portion from said slot when engaged as aforesaid while simultanously comprising means to connect the breathing circuit to the cylinder assembly as aforesaid.

4,377,164

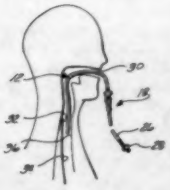
SURGICAL VENTILATING APPARATUS

Howard I. Sahbota, Southfield, Mich., assignor to Future Teck, Southfield, Mich.

Filed Aug. 1, 1980, Ser. No. 174,533

Int. Cl.³ A61M *15/08, 25/00*; B32B *9/00*

U.S. Cl. 128—207.14 **5 Claims**



1. In laser-based surgical ventilating apparatus of the type comprising a tracheal tube insertable into the throat of a surgery patient and ventilating equipment connected to the tube at one end thereof, the improvement which comprises:

a tracheal tube comprising:

(a) a hollow, flexible metallic member, and

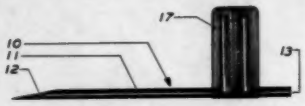
(b) an outer layer heat bonded onto the metallic member, the outer layer being resistant to perforation by the heat generated during laser surgery and being of a material selected from the group comprising aluminum oxide, magnesium oxide and blends thereof, silver oxide, zinc oxide,

titanium oxide, expanded silica, expanded perlite, foamed quartz, an aluminate or mixtures thereof.

4,377,165
CANNULA NEEDLE FOR CATHETER

Ronald B. Luther, Newport Beach, Calif.; Peter F. Frey, Buergenstock, Switzerland, and Marshall F. Sparks, Santa Ana, Calif., assignors to Luther Medical Products, Inc., Costa Mesa, Calif. and Cobra, Inc., Ennetbuergen, Switzerland

Filed Jun. 8, 1981, Ser. No. 271,663
Int. Cl.³ A61M 5/00
U.S. Cl. 128—214.4 **12 Claims**



1. A breakaway cannula needle for insertion of a catheter therethrough, comprising:

(a.) a barrel portion defining inner and outer walls, and a central longitudinal axis, the barrel being formed by cold rolling from a flat blank of stainless steel sheet metal stock having outer parallel edges;

(b.) a longitudinal slit about 0–1 mil wide defined along the barrel portion parallel to the longitudinal axis, and formed between the edges of the rolled blank, the slit defining opposed edges in parallel registry;

(c.) a continuous groove formed on the inside wall of the barrel about 180° radially of the slit and parallel thereto, at a controlled and uniform depth of about 50% ± 10% of the flatstock thickness by rolling means;

(d.) a needle portion provided at one end of the barrel, and defining a forward and rearward end, the slit extending along the barrel to one needle end, and the groove extending along the barrel to the other needle end; and,

(e.) flexing wings attached to the cannula on each side of the slit;

the flat sheet metal stock being initially grooved in a continuous manner followed by the sequential steps of: i. cold rolling the barrel; ii. segmenting to form the needle portion; and, iii. attaching the wings;

whereby, the cold rolling work hardens the barrel and embrittles the groove, thereby enabling splitting of the needle along the groove in a uniform manner, and with needle-to-needle uniformity, when the wings are flexed, to enable separation of the needle from the cannula.

4,377,166
SURGICAL EVACUATOR

Joseph R. Wilder, 151 W. 86th St., New York, N.Y. 10024; Franklin G. Reick, 228 W. Place, Westwood, N.J. 07675, and Frederick R. Picut, Rte. 22, Driveway 4, Mountainside, N.J. 07092

Continuation-in-part of Ser. No. 57,288, Jul. 22, 1970. This application Mar. 27, 1972, Ser. No. 238,177
Int. Cl.³ A61M 1/00
U.S. Cl. 128—278 **1 Claim**

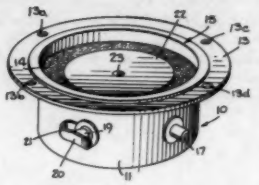
1. A self-contained, independently-operatable surgical evacuator unit adapted to drain fluid from a body site and to transfer the fluid to the unit, said unit comprising:

(A) a cup formed of rigid transparent plastic material and having a continuous side wall and an unbroken bottom wall,

(B) an elastic membrane formed of rubber covering the cup and sealed to the lip thereof to define a sump chamber to hold fluid, said membrane in its unstretched state being substantially planar,

(C) an inlet-exhaust fixture mounted on said side wall and communicating with said chamber, said fixture when functioning in an inlet mode being adapted for connection to a drain tube leading to a body site to be drained, said fixture when functioning in an exhaust mode being disconnected from said drain tube, and

(D) an actuator disc secured to said membrane and manually-operable by an inwardly-directed force to effect inward stretching of said membrane to displace the atmosphere of said chamber through said fixture in the exhaust mode in



which it is disconnected from the drain tube and to create in the inlet mode of said fixture in which it is connected to the drain tube a negative pressure acting to draw fluid into said chamber when the disc is released, said membrane then being capable of returning to its original unstretched state without the use of an external force whereby fluid withdrawn from the body site proceeds to fill said chamber.

4,377,167
EASILY REMOVABLE TAMPON

Leonard M. Kaczmarzyk; James J. Hlaban, both of Neenah, and David M. Jackson, Appleton, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

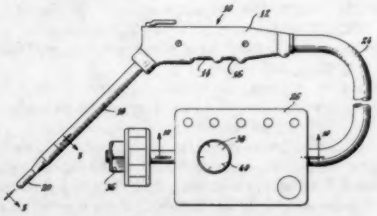
Continuation-in-part of Ser. No. 86,808, Oct. 22, 1979, Pat. No. 4,300,561. This application Aug. 3, 1981, Ser. No. 289,759
The portion of the term of this patent subsequent to Nov. 17, 1998, has been disclaimed.
Int. Cl.³ A61F 13/20
U.S. Cl. 128—285 **1 Claim**

1. A tampon comprising absorbent fibers and withdrawal means said absorbent fibers including a removal aid which does not substantially hinder absorbency selected from the group consisting of myreth-3 myristate, glycereth polyethoxy cocoate, and isopropyl palmitate.

4,377,168
CRYOSURGICAL INSTRUMENT

Ronald P. Rzasa, Fairfield, and Ronald M. Wallach, Westport, both of Conn., assignors to Wallach Surgical Instruments, Inc., Fairfield, Conn.

Filed Feb. 27, 1981, Ser. No. 236,521
Int. Cl.³ A61B 17/36
U.S. Cl. 128—303.1 **10 Claims**



1. A cryosurgical instrument for use with a remote source of pressurized gas and adapted to operate in a cooling mode and in a rapid warming or defrost mode, comprising:

a body having a wall of high thermal conductivity defining an enclosed cavity, said wall being shaped externally for contacting human tissue and providing heat transfer with the tissue and being of sufficient structural integrity to withstand the full force of a pressurized gas;

a first conduit extending through said body and terminating adjacent said cavity for metering a pressurized gas therethrough so that said gas may expand into said cavity and undergo an isoenthalpic or Joule-Thomson expansion and in so doing cool said wall;

a second conduit terminating in said cavity;

an exhaust passage leading from said cavity to atmosphere; and

first valve means for providing a cooling mode gas flow path from a source of pressurized gas, through said first conduit into said cavity and then through said exhaust passage, whereby the expansion of gas through said first conduit cools said wall, and for selectively providing a rapid warming or defrost mode gas flow path from said source of pressurized gas through said second conduit directly to said cavity for pressurizing said cavity sufficiently to condense said gas on the cool wall and liberate latent heat to warm the wall, and

continuously open second valve means between said cavity and exhaust passage for selectively back pressuring said cavity during said cooling and rapid warming or defrost mode so that during said cooling mode there is insufficient back pressure on said gas continuously flowing through said cavity to cause the same to condense therein while during said rapid warming or defrost mode, there is sufficient back pressure on said gas to cause the same to condense and give up its latent heat of vaporization to said body enclosing said cavity to warm said body while allowing said gas to be continuously discharged from said instrument prior to reinstitution of said cooling mode.

4,377,169

ION BEAM SPUTTER-ETCHED VENTRICULAR CATHETER FOR HYDROCEPHALUS SHUNT

Bruce A. Banks, Olmsted Township, Cuyahoga County, Ohio (granted to Administrator of the National Aeronautics and Space Administration under the provisions of 42 U.S.C. 2457(c))

Filed Jun. 10, 1981, Ser. No. 272,407
Int. Cl.³ A61B *27/00*
U.S. Cl. 604—8 **8 Claims**

1. In a ventricular catheter for controlling the condition of hydrocephalus by relieving the excessive cerebrospinal fluid pressure, the improvement comprising

a plurality of pliable microtubular members for conducting cerebrospinal fluid from the cerebral ventricle to selected areas of the human body, each of said microtubular members having a plurality of microscopic perforations having diameters between about 14 microns and about 150 microns in a density of approximately 1100 perforations per 20 μm per centimeter of microtube in a portion of the walls thereof adjacent to at least one end of said member.

4,377,170

NON-POLARIZABLE BIOELECTRODE

Hatim M. Carim, Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 1, 1980, Ser. No. 211,565
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—639 **17 Claims**

1. A non-polarizable biomedical electrode comprising:

an electrical impulse-sensing element having a metallic surface, said sensing element having a base portion with a lower skin-directed surface and an upper surface having means for connection to an electromedical testing apparatus; and

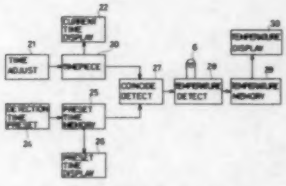
a conformable, electrically-conductive skin-interfacing material in electrical contact with said lower surface of said sensing element comprising a solvent having dissolved therein an oxidizing agent capable of oxidizing the metal on said lower surface of said sensing element to form a metallic cation, and an electrolyte salt in sufficient quantity to render said skin-interfacing material electrically-conductive, the anion of said salt being capable of reacting with said metallic cation to form an insoluble compound on said lower surface of said sensing element which causes the electrode to be non-polarizable.

4,377,171

ELECTRONIC THERMOMETER

Yoshihiro Wada, Ikoma, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 20, 1981, Ser. No. 236,581
Claims priority, application Japan, Feb. 23, 1980, 55-22097
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—736 **3 Claims**



1. An electronic thermometer comprising:

temperature measuring means for measuring a body temperature,

said temperature measuring means comprising a temperature sensor probe, an oscillator circuit of which the oscillation frequency is a function of the output signal derived from said temperature sensor probe and counter means for counting said oscillation frequency of said oscillator circuit which is a measure of said body temperature;

time information keeping means for storing current time information;

preset time memory means for storing a preselected time data at which the body temperature measuring operation is to be performed;

coincide detection means for developing a coincide detection output when the current time information stored in said time information keeping means becomes identical with said preselected time data stored in said preset time memory means;

drive means for activating said temperature measuring means when said coincide detection output is developed from said coincide detection means;

temperature memory means for storing a measured temperature derived from said temperature measuring means in response to said coincide detection output derived from said coincide detection means; and

a temperature display unit for displaying said measured temperature stored in said temperature memory means,

said temperature memory means comprising a latch circuit for storing the count information relayed from said counter means, said count information representing a function of the body temperature for display on said body temperature display unit, whereby the temperature measuring means performs the body temperature measuring operation via said temperature sensor probe automatically in response to said output signal derived from said temperature sensor when said coincide detection output signal is received from said coincide detection means, the body temperature data obtained in said temperature measuring means being applied to and stored in said temperature memory means for display on said temperature display unit.

4,377,172
APPARATUS FOR TRANSPORTING FILTER ROD SECTIONS OR THE LIKE

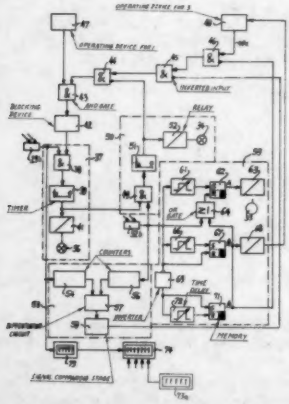
Jürgen Burger, Marschacht, and Alois Kasparek, Hamburg, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Feb. 24, 1981, Ser. No. 237,752

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1980, 3006947

Int. Cl.³ A24C *5/32, 5/35*

U.S. Cl. 131—282 **24 Claims**



1. Apparatus for transporting rod-shaped articles which constitute or form part of smokers' products, comprising a pneumatic conveyor having an inlet and an outlet; a sender operable to deliver a succession of rod-shaped articles into the inlet of said conveyor; a receiver adjacent to said outlet and operable to accept successive articles from said conveyor; a monitoring device adjacent to said sender and including means for generating a series of impulses in response to travel of successive articles in said conveyor so that said series of impulses is indicative of the presence, absence and rate of delivery of articles from said sender to said inlet; and means for evaluating said series of impulses, including signal generating means activatable to transmit signals in the absence and/or on deviation of said series of impulses from a predetermined sequence.

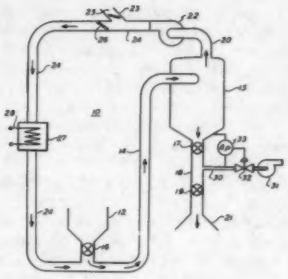
4,377,173
METHODS AND APPARATUS FOR EXPANDING TOBACCO

Ronald D. Rothchild, South Orange, N.J., assignor to Airco, Inc., Montvale, N.J.

Division of Ser. No. 13,484, Feb. 16, 1979, Pat. No. 4,308,876. This application Mar. 18, 1981, Ser. No. 244,847

Int. Cl.³ A24B *3/18*

U.S. Cl. 131—291 **11 Claims**



1. Apparatus for expanding solid carbon dioxide containing tobacco comprising an expansion chamber, means for introducing said solid carbon dioxide containing tobacco into said expansion chamber; means for heating the atmosphere in said expansion chamber to thereby expand said tobacco and form a chamber atmosphere comprised substantially of carbon dioxide gas and volatilized moisture and organic materials; means connected to said expansion chamber for separating expanded tobacco from said chamber atmosphere; means for discharging expanded tobacco from said separating means; and means for substantially precluding gas flows through said expanded tobacco discharge means.

4,377,174
METHOD AND APPARATUS FOR APPLYING PERMANENT WAVE

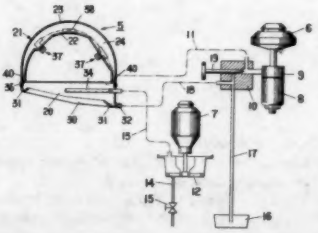
Takashi Muraji, Nishinomiya, and Hiroshi Kitamura, Osaka, both of Japan, assignors to SMK Industries, Osaka, Japan

Filed Dec. 10, 1979, Ser. No. 101,641

Claims priority, application Japan, Dec. 12, 1978, 53-155178; Dec. 12, 1978, 53-155179

Int. Cl.³ A45D *1/00*

U.S. Cl. 132—9 **16 Claims**



1. A method of applying a permanent wave comprising: a first solution applying step including winding the user's hair on curlers, applying the first solution to the user's hair and putting a permanent wave applying hood on the user's head; a first

solution permeating step including actuating at least one of steam blowing and heating means installed in said permanent wave applying hood to cause the first solution to sufficiently permeate the user's hair; testing the elasticity of the curls of the user's hair prior to the spraying of any further solutions and without removing the user's head from the entire hood; subsequently spraying a second permanent wave applying solution over the hair within the permanent wave applying hood; and a second solution permeating step including actuating at least one of said steam blowing and heating means concurrently with said second solution spraying step to cause the second solution to sufficiently permeate the user's hair.

4,377,175

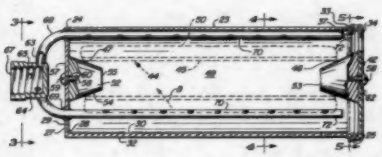
APPARATUS FOR CLEANING ROLLER APPLICATORS

Stewart J. Fritz, 6935 E. Wilshire Dr., Scottsdale, Ariz. 85257

Continuation-in-part of Ser. No. 97,929, Nov. 28, 1979, abandoned. This application Aug. 18, 1980, Ser. No. 179,231

Int. Cl.³ B08B *3/02*

U.S. Cl. 134—138 **9 Claims**



1. An apparatus for holding a roller-type applicator, which applicator includes:
   an outer generally cylindrical surface,
   a centrally located bore, and
   a pair of opposed open ends,
and for receiving pressurized liquid from a source thereof and for utilizing said liquid to rotate and clean said applicator, said apparatus comprising:
   a. a container including
      i. a continuous side wall,
      ii. a closed end, and
      iii. an open end;
   b. a cap detachably securable with the open end of said container and having fluid drainage means therethrough, said cap having
      i. a generally centrally located bearing support element carrying the other of said bearings,
      ii. at least two spaced apart arms extending outwardly from said bearing support element and having spaces therebetween defining said fluid drainage means, and
      iii. attachment means for detachably securing said cap to said container, said attachment means including a plurality of openings extending through the side wall of said container proximate the open end thereof, said openings sized and spaced to receive a terminal portion of said legs therethrough, and stop means carried by end of said legs for abutting the side wall of said container and limiting the length of the terminal portion of said legs received through said openings;
   c. a pair of spaced apart axially aligned bearings for rotatably supporting said applicator, one of said bearings being carried by the closed end of said container, the other of said bearings being carried by said cap; and
   d. fluid transfer means carried by said housing for receiving said pressurized fluid and for directing said fluid toward said applicator.

4,377,176

PRESSURE REDUCER FOR HYDRAULIC BRAKE SYSTEMS

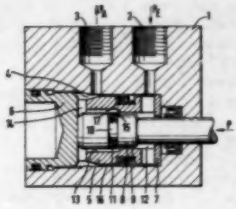
Bernd Schopper, Hattersheim; Peter Tandler, Falkenstein, and Derek Lowe, Glashütten, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Mar. 2, 1981, Ser. No. 239,734

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1980, 3009427

Int. Cl.³ B60T *8/26*

U.S. Cl. 137—493.2 **31 Claims**



1. A pressure reducer for hydraulic brake systems comprising:
   a stepped piston displaceable in a housing bore, said stepped piston being loaded by a prestressing force having the end surface of its smaller diameter portion disposed in an inlet chamber and the end surface of its larger diameter portion disposed in an outlet chamber; and
   a sealing ring disposed in a circumferential groove in said piston, said groove having one wall adjacent said outlet chamber disposed in a step between said larger diameter portion and said smaller diameter portion extending radially from a bottom of said groove to the outer surface of said larger diameter portion and another wall parallel to said one wall adjacent said inlet chamber extending radially from said bottom of said groove to the outer surface of said smaller diameter portion, said sealing ring having a sealing section of maximum diameter with an end wall thereof abutting said one wall of said groove and a smaller diameter transitional section extending from said sealing section toward said inlet chamber, and said sealing ring completely filling said groove at least adjacent said one wall of said groove and said bottom of said groove in the area of said sealing section, said sealing section sealing an opening in the inner wall of said bore of an axial groove in said housing extending from said outlet chamber toward said inlet chamber.

4,377,177

THROTTLING MUD CHOKE APPARATUS

Jack R. Claycomb, 8226 Wayrener, Houston, Tex. 77040

Division of Ser. No. 30,473, Apr. 16, 1979, Pat. No. 4,281,678, which is a continuation-in-part of Ser. No. 727,031, Sep. 27, 1976, Pat. No. 4,190,073. This application May 8, 1981, Ser. No. 261,961

Int. Cl.³ B08B *3/00*; **F16K** *47/04*

U.S. Cl. 137—15 **2 Claims**

1. A method of controlling drilling mud flow in a drilling mudchoke which choke includes:
   a hollow valve body having a passage therethrough;
   a valve seat having an encircling, tapered face surrounding an axial passage for directing mud flow past said tapered face and along said passage within said valve body;
   an encircling circular valve seat shoulder in a plane perpendicular to the flow through said axial passage which shoulder defines an upstream located closure face cooperatively positioned relative to said valve seat tapered face;
   a valve element having an external tapered face conforming to said valve seat tapered face wherein said valve element,

on movement, moves into a concentric, centrally positioned throttling location within said valve seat opposite said valve seat tapered face and wherein said valve element and said valve seat tapered faces define a gap therebetween for throttling mud flow passing through the gap, and wherein said valve element controllably blocks the axial passage flow of mud past said valve seat;

said valve element and said valve seat tapered faces are defined by straight line segments in axial section;

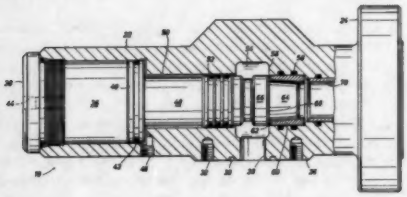
a surrounding circular shoulder on said valve element which shoulder is adapted to conform to and seat against said valve seat shoulder to plug and close the flow of mud through the gap between said valve element and said valve seat, wherein said valve element and valve seat define a minimum gap at closure of said valve element relative to said valve seat;

means for moving said valve element into a fully closed position relative to said valve seat;

inlet and outlet means communicating with said passage through said valve body; and

wherein the method includes the steps of:

(a) positioning the valve element in the hollow valve body and spaced from the valve seat such that the encircling circular valve seat shoulder and the surrounding shoul-



der on the valve element are facing one another and moved toward or away from one another on movement of the valve element in the valve body and such movement varies the volume of mud flowing therepast;

(b) further positioning the valve element in the valve seat to enable the tapered face of the valve element to move into a throttling position relative to the encircling tapered face of the valve seat between first and second throttling locations relative to the valve seat to define a gap therebetween wherein mud flow between the tapered faces in the gap is reduced in the second throttling position as the gap is narrowed on movement;

(c) defining a flow path from the inlet means of the hollow valve body and then between the encircling and facing circular shoulders, and which flow path then flows through the gap defined by the valve element and valve seat facing tapered faces, and thereafter extending along the passage to the outlet means;

(d) selectively closing the upstream encircling and facing circular shoulders fully to interrupt mud flow therepast; and

(e) wherein the step of closing the upstream encircling and facing circular shoulders creates a cleaning and flushing flow effect which prevents particles of a certain size in the drilling mud from flowing through the gap.

4,377,178

ANTI THEFT VALVE LOCKING DEVICE

Harold Thompson, 379 Demorest Ave., Staten Island, N.Y. 10314

Continuation-in-part of Ser. No. 158,895, Jun. 12, 1980, abandoned. This application Feb. 12, 1982, Ser. No. 348,216

Int. Cl.³ F16K *35/00*

U.S. Cl. 137—385 **1 Claim**

1. An anti theft locking device which comprises:

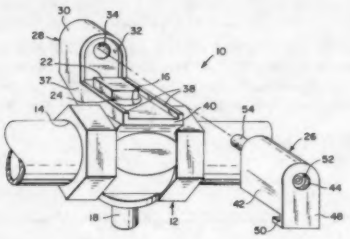
a casing having a longitudinal passage therethrough and a transverse tapered bore intersecting said passage;

a tapered plug having an aperture with a top square head portion on larger end of said plug, said plug fitted for rotation in said tapered bore to control said passage;

means for preventing rotation of said top square head portion of said plug, wherein said casing further contains an L-shaped top portion which comprises;

a vertical locking member with a recessed wall having a horizontal aperture and a groove within;

a horizontal channel member having said transverse tapered bore exiting therethrough between a pair of guide rails and a free end thereof, wherein said means for preventing rotation of said top square head portion of said plug is a locking cover which further comprises:



a housing having a horizontal aperture therethrough, a rectangular slot in the bottom of said housing and a vertical arm having a rearwardly turned lip; and

a ball barrel key activated lock forced fit into said horizontal aperture of said housing with locking end extending rearwardly so that when said housing slidably contacts said horizontal channel member butting against said recessed wall of said vertical locking member with said rearwardly turned lip engaging said free end of said horizontal channel member and said rectangular slot of said housing capturing said top square head portion of said plug preventing rotation, said locking end of said barrel key activated lock will enter said horizontal aperture and groove, locking said housing to said L-shaped top portion of said casing.

4,377,179

PRESSURE BALANCED BALL VALVE DEVICE

Bernhardt F. Giebeler, San Bernardino, Calif., assignor to Bernhardt & Frederick Co., Inc., San Bernardino, Calif.

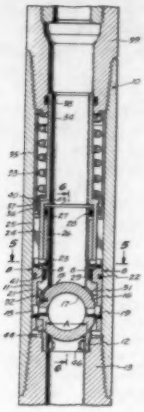
Filed Oct. 28, 1980, Ser. No. 201,426

Int. Cl.³ F16K *31/163, 39/00*

U.S. Cl. 137—494 **6 Claims**

1. A pressure operated valve comprising, in combination: a tubular housing having a central axial bore, a carrier sleeve mounted for limited axial movement within the housing bore and having sealing contact therewith, diametrically opposed trunnions mounted on said carrier sleeve and having a common transverse axis, a ball valve having a central opening and mounted to turn about said transverse axis between an open position and a closed position, a stationary seat on the housing for said ball valve, a piston sleeve having sealing contact with the inner surface of said housing bore, pressure operated means including said piston sleeve for turning said ball valve about said transverse axis, the effective circular cross-section area of said ball valve closed against said seat being substantially equal to the annular cross-section area of the carrier sleeve between the housing bore and said inner surface of said carrier sleeve, so

that hydraulic forces within the housing acting to hold the ball valve in closed position against said seat are substantially bal-



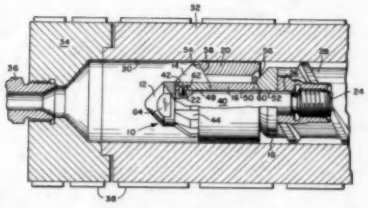
anced by forces in the opposite direction acting against said carrier sleeve.

4,377,180

NON-RETURN VALVE FOR PLASTIC INJECTION MOLDING

William H. Biljes, Olmsted Falls, Ohio, assignor to Component Manufacturing & Design, Inc., North Royalton, Ohio

Filed Nov. 10, 1980, Ser. No. 205,196
Int. Cl.³ B29F *1/04*
U.S. Cl. 137—528 **8 Claims**



1. A non-return flow valve for valving the flow of molten plastic in a plastic injection molding machine, said machine having a barrel and a reciprocating feed screw mounted in a bore in said barrel, said valve comprising:

(a) valve body means, said valve body means including,
- (i) means for connecting said body means to said feed screw,
- (ii) a cylindrical body portion,
- (iii) a shoulder portion extending outward radially from said cylindrical body portion, said shoulder portion spaced axially from said connecting means, said cylindrical body portion disposed intermediate said shoulder portion and said connecting means;

(b) first valve seat means slidably received over said cylindrical body portion, said first valve seat means including means defining:
- (i) a first valve seating surface,
- (ii) a plurality of flow passageway means formed in said first valve seat means, said flow passageway means in fluid communication with said first valve seating surface at the inlet end thereof, and,
- (iii) a generally transverse surface portion in abutment with said shoulder portion;

(c) a second valve seat means slidably received over said cylindrical portion, said second valve seat means including means defining,
- (i) a transverse surface portion engageable with said feed screw,
- (ii) a second annular valve seating surface disposed axially opposite said transverse surface;

(d) a tubular spacer slidably received over said cylindrical portion, said spacer disposed intermediate said first and second valve seat means for establishing a predetermined spacing between said first and second valve seating surfaces;

(e) an annular valve member received over said body means, said valve member having,
- (i) an outer cylindrical surface portion adapted for closely fitting, sliding relationship with said barrel bore,
- (ii) a first annular valve surface formed on one end face thereof,
- (iii) a second annular valve surface formed on the other end face thereof, said second valve surface disposed opposite said first valve surface,
- (iv) said first and second valve surfaces longitudinally spaced an amount less than said predetermined spacing between said first and second valve seating surfaces,
- (v) an inner cylindrical surface portion having an internal diameter greater than the outer diameter of said tubular spacer for defining an annular fluid passageway therebetween;

(f) anti-rotation means for preventing rotation of said first valve seat means relative to said valve body means, said anti-rotation means including,
- (i) a radially extending pin having a first portion thereof mounted in a bore in said cylindrical body portion and a second portion thereof extending outwardly therefrom,
- (ii) said first annular valve seat means has a cylindrical bore formed therethrough and in closely fitting relationship to said cylindrical body portion, and an axially extending notch formed into said cylindrical surface portion adjacent said transverse surface portion, said second portion of said pin extending into said notch; and

(g) said valve member movable between an open position in which said first valve surface is in abutment with said first valve seating surface in which molten plastic flows from said feed screw between said second valve surface and said second annular valve seating surface, through said annular passageway, and exhausting through said flow passageways in said first valve seat means exteriorly of said one-way flow valve, said valve member movable to a closed position in which said second valve surface is in sealing abutment with said second valve seating surface such that said molten plastic is prevented from flowing toward said feed screw.

4,377,181

HIGH TEMPERATURE DUAL BUTTERFLY VALVE

John C. H. Chan, Houston, Tex., assignor to Houston Systems Manufacturing Co., Inc., Houston, Tex.

Filed Jun. 1, 1981, Ser. No. 268,825
Int. Cl.³ F16K *1/20, 1/46*
U.S. Cl. 137—594 **25 Claims**

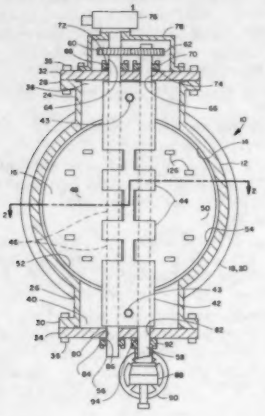
1. A high temperature butterfly valve comprising:

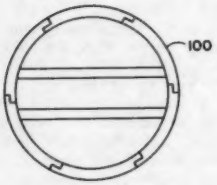
a valve body adapted to be connected into a flow system and being formed to define a flow passage generally coextensive with the flow way defined by said flow system, said valve body also defining an internal valve seat means within said flow passage and defining a transverse access opening in communication with said flow passage;

shaft support means extending transversely of said flow passage and being immovably interconnected with said valve body;

a pair of partial disc closure elements being positioned within said flow passage and defining sealing surface means adapted to establish sealing relationship with said valve seat means;

a pair of closure actuating shafts being positioned within said valve body and extending in transverse relation with said flow passage, each said disc closure elements being pivotally supported within said flow passage by respective ones of said closure support shafts;





said closure elements and said support shafts being removable from said flow passage transversely through said transverse access opening and facilitating repair of said valve while positioned in said flow line; and

means for controlling pivotal positioning of said closure elements relative to said valve seat means.

4,377,182

THREE-WAY VALVE

Albert L. Semon, 11 Eliot Pl., Short Hills, N.J. 07078

Filed May 20, 1981, Ser. No. 265,544

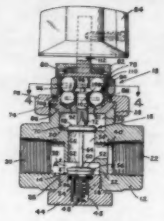
Int. Cl.³ F16K *31/524*

U.S. Cl. 137—596.1 **9 Claims**

1. In an improved three-way valve including a pipe coupling housing having an inlet port, an outlet port and an exhaust port and having control and valve members formed therein and wherein there is disposed in said valve chamber a spring-loaded valve assembly for selective positioning thereof between a first position and a second position for fluid flow between said inlet port and said outlet port and between said outlet port and said exhaust port, respectively, and wherein the valve assembly is provided with a valve shaft for selective positioning of said valve assembly and wherein said valve shaft extends into said control chamber and wherein there is provided a manipulative handle including a control shaft and wherein said control shaft extends into said control chamber, an improved valve engagement assembly for said valve, which comprises:

first ball members disposed on a pin positioned on said valve shaft within said control chamber; and

second ball members disposed on a pin positioned on said control shaft within said control chamber and adjacent to



said first ball members whereby rotation of said manipulative handle cause rotation of said control shaft causing said second ball members to contact said first ball members thereby exerting a downward force on such first ball members moving said valve shaft downwardly and correspondingly moving said valve assembly from said first position to said second position.

4,377,183

ADJUSTABLE FLOW RESTRICTING VALVE

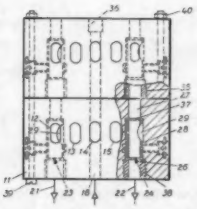
Folke L. Johansson, Malsryd, and Bengt F. S. Svenning, Fritsla, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Continuation of Ser. No. 886,753, Mar. 15, 1978, abandoned, which is a continuation-in-part of Ser. No. 723,069, Sep. 14, 1976, abandoned. This application Mar. 21, 1980, Ser. No. 132,410

Claims priority, application Sweden, Sep. 19, 1975, 7510498

Int. Cl.³ F16K *5/10, 31/53*

U.S. Cl. 137—606 **16 Claims**



1. An adjustable flow restricting valve comprising:

a housing (**11**);

a first passage (**26,27**) extending completely through said housing (**11**) and comprising a cylindrical bore (**27**);

a tubular valve body (**28**) open ended at both ends thereof and rotatably supported in said bore (**27**) and forming a part of said first passage (**26,27**), said tubular valve body (**28**) being formed of a plastic material;

a second passage (**25**) in said housing (**11**) extending laterally from said first passage (**26,27**);

said tubular valve body (**28**) being cylindrical and having a longitudinal rotation axis about which it is rotatable in said bore (**27**), said valve body (**28**) having a lateral opening (**29**) therein by means of which said valve body (**28**) in response to its angular position controls communication between said first and second passages (**25,26**); and

a maneuver means (**30**) movably supported in said housing (**11**) and contacting said valve body (**28**) for producing

angular displacement of said valve body (28) in said bore of said first passage (26,27) about said longitudinal rotation axis of said valve body (28), said maneuver means (30) including an elongated screw (30) arranged with its longitudinal axis perpendicular to a plane which includes the rotation axis of said valve body (28) and directly contacting said valve body (28) to form a worm gear with said valve body (28), said elongated screw (30) having self-tapping threads thereon which are arranged to cut gear teeth on said plastic tubular valve body (28).

4,377,184

PLUG

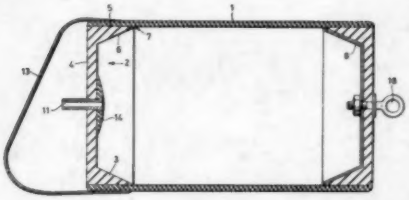
Manfred Vetter, Burg Langendorf, 5352 Zülpich, Fed. Rep. of Germany

Continuation of Ser. No. 118,071, Feb. 4, 1980, abandoned, which is a continuation of Ser. No. 955,640, Oct. 27, 1978, abandoned. This application Nov. 6, 1980, Ser. No. 204,756

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1977, 2748614

Int. Cl.³ F16L *55/12*

U.S. Cl. 138—89 **12 Claims**



1. A plug, particularly for plugging a tube or pipe, comprising an elongated tubular casing of elastomeric material having two open ends longitudinally spaced from each other; two cupped caps each inserted in a respective open end of said casing and bounding with said casing an interior of the plug, each of said caps having a conical cross-section circumferentially elongated wall extending inside said interior and having an outer surface in surface contact with a corresponding portion of the casing, each cap also having an inner surface, each of said walls being vulcanized to said corresponding portion of the casing so as to sealingly close the latter from both ends thereof; and a conical cross-section supporting ring mounted so as to support at least one of said caps and located so as to engage the inner surface of said one cap and urge said elongated wall thereof against the corresponding portion of the casing, each of said caps further comprising an end wall peripherally connected to the respective elongated wall, at least one of said end walls extending normal to the elongation of said casing and being even with a respective end face of said casing when said caps are in assembly with said casing, the end wall of at least one of said caps being provided with at least one through-going hole; and means for facilitating movement of the plug relative to the tube to be plugged, said facilitating means including a member fixedly mounted on one of said caps and extending outwardly away from the same.

4,377,185

HYDROTEST APPARATUS

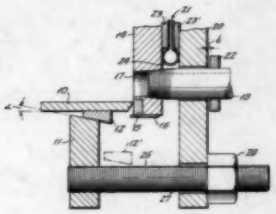
Lyber Katz, New York, N.Y., assignor to Tubeco, Inc., Brooklyn, N.Y.

Filed Dec. 18, 1980, Ser. No. 217,669

Int. Cl.³ G01M *3/28*

U.S. Cl. 138—90 **13 Claims**

1. Removable end-closure structure for sealed application to the end of a pipe of given outside diameter for hydrostatic pressure-testing the pipe, said structure comprising a split ring having a cylindrical inner surface of substantially said diameter for mounting to the outer surface of the pipe near an end of the pipe, said split ring having a conical outer surface to be oriented with outward divergence in the direction of the pipe end to be closed, a circumferentially continuous anchor ring having a conically tapered bore of substantially the slope of the outer-surface taper of said split ring and adapted for convergent inwardly compressing coaction with said split ring upon axial displacement of said anchor ring in said pipe-end direction, a first or closure plate of diameter to lap the end of the pipe but less than the outer diameter of said anchor ring, said closure plate being adapted for circumferentially continuous axially abutted sealing engagement with the end of the pipe, said closure plate being characterized by a circumferentially continuous rabbet containing circumferentially continuous



locally yieldable gasket material at least in the annular radius range of pipe-end contact, said rabbet being radially outwardly open, a circumferential strap peripherally secured to said closure plate and axially spanning the rabbeted region, a second or back-up plate of substantially the outer diameter of said anchor ring, lost-motion retaining means coaxially retaining said plates within a fixedly limited maximum axial offset of said back-up plate from said closure plate, axially adjustable tie means between radially lapping regions of said anchor ring and backing plate, and fluid-pressure operated means interposed between said plates for pressure-loading said plates for their axially separating relative displacement within said axial offset and in the direction of approach to the maximum of said axial offset.

4,377,186

FLOATING FLEXIBLE TUBES

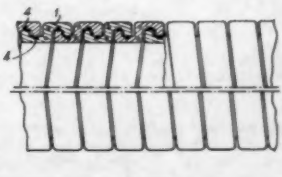
Maurice Genini, Creteil; Christian Athe, Le Mee, and Jean-Paul Aubert, Puteaux, all of France, assignors to Coflexip, Rueil, France

Continuation of Ser. No. 13,177, Feb. 21, 1979, abandoned. This application Jun. 1, 1981, Ser. No. 269,505

Claims priority, application France, Feb. 21, 1978, 78 04886

Int. Cl.³ F16L *11/04, 11/06*

U.S. Cl. 138—111 **4 Claims**



1. A flexible buoyant tube comprising a belt which is self-fastening and of a thermoplastic material having a density of less than 1, the cross-section of said belt being in the form of an elongated S-shape, said S-shape having an inwardly facing channel and an outwardly facing channel, the bottom wall of each channel having a groove therein extending substantially parallel to the direction of the channel and said belt being wound spirally with overlap and threading and with interlocking of successive spirals so that each edge of each spiral over-

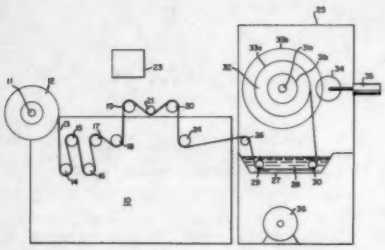
lies a groove in the adjacent spirals whereby said grooves form spiral passages, and at least one elongated flexible watertight element which is spirally wound and disposed in at least one of said passages.

4,377,187

LIQUID SMOKE IMPREGNATED FIBROUS FOOD CASING

Herman S. Chiu, Chicago, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 11, 1981, Ser. No. 301,275
Int. Cl.³ D03D *13/00*; A22C *13/00*; A23L *1/22*
U.S. Cl. 138—118.1 **20 Claims**



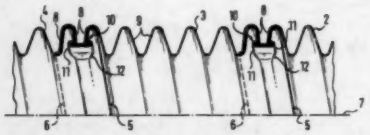
1. A fibrous reinforced cellulosic food casing with a wood-derived liquid smoke having a total acid content of at least about 6 weight percent based on the weight of said liquid smoke including color, odor and flavor constituents, being impregnated in the casing wall, the impregnated liquid smoke being present in sufficient quantity to provide a casing absorptive index of at least about 0.15, said casing having a moisture content of between about 17 and about 60 percent of the total casing weight, with the impregnated liquid smoke providing antimycotic quality in said casing without a separate antimycotic agent.

4,377,188

FLEXIBLE CORRUGATED TUBE

Emil Siegwart, Michael-Blatter-Strasse 6, 6603 Sulzbach-Neuweiler, Fed. Rep. of Germany

Filed Feb. 9, 1981, Ser. No. 232,558
Claims priority, application Canada, Sep. 19, 1980, 360581
Int. Cl.³ F16L *11/16*
U.S. Cl. 138—122 **18 Claims**



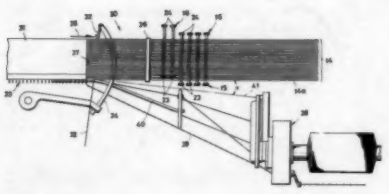
1. A flexible corrugated tube (1) of a spirally coiled thin metal strip having corrugations extending parallel to the longitudinal direction thereof, in which tube at least one corrugation of the one side edge of a strip convolution (2) lies in at least one corrugation on the other overlapping side edge of the subsequent convolution (3), and small sections of the crests of corrugations lying one within the other are pressed down with respect to said crests by only a part of the corrugation height to become detents (10) in such a manner that the corrugation crests are wider than the corrugation cross-section located beneath same, characterized in that the corrugations having depressed crests have sides (flanks) or lateral walls (8), respectively, outside the detents (10) at right angles to, or approximately at right angles to the axis (7) of the tube and corrugations located therebetween having no detents have a V-shaped or saw-tooth-shaped cross-section with sides or lateral walls (9) extending obliquely to the axis of the tube.

4,377,189

HARNESS FRAME FOR LOOMS

Kihei Takahashi; Seiko Terada, both of Uozu, and Muchiji Shimono, Namerikawa, all of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Division of Ser. No. 90,996, Nov. 5, 1979. This application Apr. 30, 1981, Ser. No. 258,901
Claims priority, application Japan, Nov. 20, 1978, 53-159749
Int. Cl.³ D03D *13/00*
U.S. Cl. 139—35 **2 Claims**



1. An apparatus for manufacturing a slide fastener stringer including a stringer tape, woven of a plurality of warp threads and a weft thread, and a coiled fastener coupling element woven into the stringer tape along one longitudinal edge thereof simultaneously with the weaving of the stringer tape, said apparatus comprising:

(a) a plurality of harnesses for shedding the warp threads;

(b) a filling carrier for inserting the weft thread through the warp shed;

(c) a latch needle for catching and knitting the weft thread in the warp shed to form a selvedge along the other longitudinal tape edge;

(d) a reed for beating the weft thread in the warp shed into the fell of the stringer tape;

(e) a mandrel for extending alongside the warp threads; and

(f) a coiling rotor for coiling a monofilament in a conical orbital path around said mandrel to shape the monofilament into the fastener coupling element to be woven into the stringer tape by the weft thread;

(g) each of said harnesses having a centrally open planar frame including a pair of parallel spaced vertical outermost side members and a pair of heddle-support bars extending perpendicularly from said vertical side members, at least one of said vertical side members having an intermediate portion extending, in horizontal cross section, at a right angle to the general plane of said frame;

(h) a first group of said harnesses adjacent to the fell of the stringer tape being positioned such that said one vertical side member of each said harness of the first group is disposed between an adjacent pair of the warp threads, a second group of said harnesses remote from the fell of the stringer tape being positioned such that said one vertical side member of each said harness of the second group is disposed between an innermost one of the warp threads and an inner side of the conical orbital path of the monofilament.

4,377,190

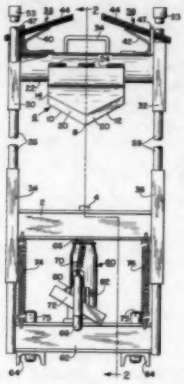
LOG SPLITTER

Michel A. Pierrat, 48 Farrwood Dr., Andover, Mass. 01810

Continuation of Ser. No. 873,060, Jan. 27, 1978, abandoned. This application Jul. 15, 1980, Ser. No. 169,154

Int. Cl.³ B27L 7/00

U.S. Cl. 144—193 A 9 Claims



1. In apparatus for splitting a log, the combination comprising

a frame,

a support slidably mounted on said frame and adapted to engage one end of a log to be split,

a carriage slidably mounted on said frame,

a wedge secured to said carriage and adapted to engage the opposite end of said log,

manual quick-release clamping means slidably mounted with respect to said frame including spring means normally clamping said carriage to said frame and lever means arranged to be actuated with one hand against the force of said spring means to release said carriage from said frame, and

drive means arranged to cause relative closing movement between said support and said wedge thereby to force said wedge into said log.

4,377,191

COLLAPSIBLE CONTAINER

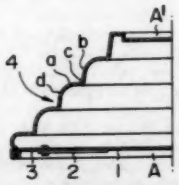
Kinichiro Yamaguchi, Tokyo, Japan, assignor to Kabushiki Kaisha Ekijibishon, Tokyo, Japan

Continuation of Ser. No. 758,398, Jan. 11, 1977, abandoned. This application Nov. 30, 1978, Ser. No. 964,960

Claims priority, application Japan, Jul. 3, 1976, 51-88523[U]; Nov. 1, 1976, 51-147766[U]

Int. Cl.³ B65D 1/40

U.S. Cl. 150—0.5 7 Claims



1. A collapsible container made of metal comprising:

collapsible stepped walls which are formed by alternating substantially horizontal surfaces and substantially vertical surfaces, the width of said substantially horizontal surfaces of the stepped walls being smaller than that of said substantially vertical surfaces;

connecting portions between said substantially horizontal and said substantially vertical surfaces being alternately angled and curved;

whereby when the container is collapsed after being used with portions between said angled connecting portions and said curved connecting portions being bent, said curved connecting portions are moved successively into said vertical surfaces.

4,377,192

PITCHER-LIKE VESSEL WITH REINFORCED HANDLE

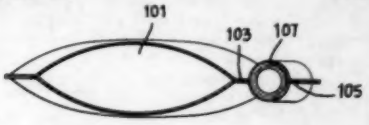
Raoul L. A. Gautier, Belmont sur Vair, France, assignor to Societe Generale des Eaux Minerales de Vittel, Vittel, France

Filed Sep. 15, 1980, Ser. No. 187,561

Claims priority, application France, Jan. 28, 1980, 80 02187

Int. Cl.³ B65D 33/06

U.S. Cl. 150—12 3 Claims



1. A pitcher-like vessel formed of thin, flexible plastic comprising superimposed layers bonded together along weld lines to define a larger open-topped main cavity for receiving material to be held in the vessel and an elongated secondary cavity separated by a weld line from the main cavity and extending along a side edge of the vessel with the upper end of said secondary cavity being positioned adjacent the upper end of the vessel and the lower end of the secondary cavity being in the vicinity of the lower end of the vessel, elongated rigid solid reinforcing means extending internally along the length of the secondary cavity so as to substantially fill the secondary cavity so that the portion of the vessel enclosing the secondary cavity serves as a pouring handle without any aperture extending through the vessel between the portion serving as the pouring handle and portion defining the main cavity.

4,377,193

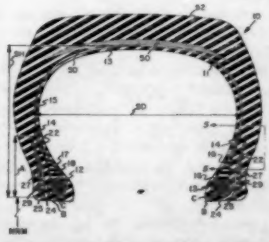
PNEUMATIC TIRE AND METHOD FOR MAKING SAME

Grahame N. W. Smith, Silverlake, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 5, 1980, Ser. No. 213,421

Int. Cl.³ B60C 15/04, 15/06; B29H 17/32, 5/00

U.S. Cl. 152—354 R 16 Claims



1. A large pneumatic tire having a ground-engaging tread portion, a pair of bead portions said bead portions each having a substantially inextensible bead core, a pair of sidewall por-

tions, each of said sidewall portions extending from one of said lateral ends of said tread portions radially inward terminating at one of said bead portions, respectively, a carcass reinforcing structure extending circumferentially about said tire from one of said bead portions through said sidewall portions and said tread portion terminating in the other bead portion, said carcass structure having its lateral ends wrapped about each of said bead cores respectively, characterized by a second pair of reinforcing bead cores each being disposed axially outward of each of said respective bead cores, said carcass reinforcing structure and said lateral ends of said carcass structure, a second reinforcing structure is wrapped about each of said second reinforcing bead cores and extends radially outward with respect to the axis of rotation of said tire terminating prior to reaching the maximum section width of the tire, wherein said second reinforcing structure constitutes the exclusive reinforcement wrapped around each of said second reinforcing bead cores, an elastomeric spacer is disposed between said second reinforcing structure and said lateral ends of said carcass structure, said tire having a sufficient amount of elastomeric material adjacent said second reinforcing structure such that during vulcanization of said tire said second reinforcing structures are placed in tension.

14. A method of building a tire on a high crown building drum comprising the steps of:

providing a carcass reinforcing structure about the circumference of said building drum;

providing a pair of substantially inextensible bead cores radially about said structure and adhering thereto said bead cores in axially spaced apart position;

folding the lateral ends of said reinforcing structure about said bead cores;

providing a second preassembled reinforcing structure about each of said cores, said preassembled structure comprising at least one fabric strip folded about a second inextensible bead core;

providing an elastomeric sidewall structure about said reinforcing structure;

shaping the assembly to a substantially toroidal configuration;

providing an elastomeric tread structure circumferentially about the outer periphery of said tire;

vulcanizing said tire to its final configuration, said tire having a sufficient amount of elastomeric material adjacent said reinforcing structures so that during vulcanization said elastomeric material flows radially outward thereby causing said cords of said reinforcement strips to be placed in tension.

4,377,194

TILT AND LIFT MECHANISM FOR VENETIAN BLIND

Parker I. Tsuhako, Gardena, Calif., assignor to Ohline Corporation, Gardena, Calif.

Filed Oct. 20, 1980, Ser. No. 199,113
Int. Cl.³ E06B 9/30
U.S. Cl. 160—168 R **25 Claims**

1. A Venetian blind having a plurality of slats supported in a spaced relationship by a support structure comprising:

a headrail;

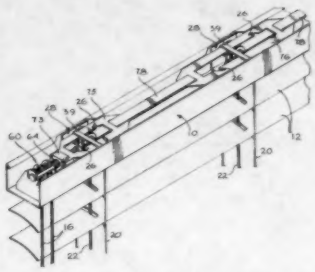
at least a pair of lift strings threaded through the slats in positions displaced longitudinally of the headrail on opposite sides of the center plane of the blind, traversing the headrail over guide means, and exiting the headrail;

at least a pair of tilt ladders having strings positioned adjacent said lift strings, adapted to support and tilt said slats, and passing into said headrail;

drive means including drive members connected to the tilt ladders, the drive members being connected together to move in unison longitudinally in the same direction to effect tilting of said slats, and a carrier coupled to at least one drive member and threadably engaging a pulley shaft;

a shaft and associated drive pulley, the shaft being oriented longitudinally of the headrail and threaded along at least part of its length for engaging the carrier; and

a tilt string coupled to rotate the drive pulley;



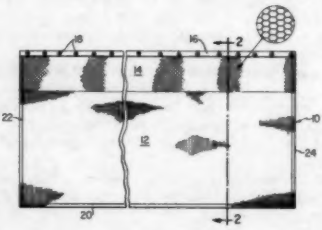
the carrier and shaft being effective to translate rotation of said pulley to longitudinal movement of the drive members.

4,377,195

PRIVATE CUBICLE ENCLOSURE

Hans Jack Weil, 550 Sheridan Sq., Evanston, Ill. 60202

Filed Jun. 17, 1980, Ser. No. 160,328
Int. Cl.³ A47H 23/02
U.S. Cl. 160—237 **15 Claims**



1. A private cubicle enclosure for use with a supporting structure, which enclosure comprises a fabric constructed of knitted, inherently flame resistant yarn materials, the fabric having a first warp knitted section having knitted stitches of a stitch density sufficient to render said first section sufficiently opaque to provide privacy for a user on one side thereof, the knitted stitches of said first section being of uniform stitch density throughout said first section, a second section directly contiguous with said first section and formed integrally with said first section, said second section being warp knitted and in the form of an open mesh construction having knitted stitches of lesser stitch density than the density of the knitted stitches of said first section to permit the passage of light and air therethrough to provide ventilation for the user, the knitted stitches of said second section being of uniform stitch density throughout said second section, said first and second sections being constructed entirely from the same yarn materials to impart to said fabric uniform dyeing, wearing and washing characteristics, and means associated with said fabric for suspending the entire fabric construction from a supporting structure.

6. A private cubicle enclosure for use with a supporting structure, which enclosure comprises a fabric constructed of warp knitted, inherently flame resistant yarn materials, the fabric having a first warp knitted section having knitted stitches of a stitch density sufficient to render said first section sufficiently opaque to provide privacy for a user on one side thereof, the knitted stitches of said first section being of uni-

form stitch density throughout said first section, a second section directly contiguous with said first section and formed integrally with said first section, said second section being warp knitted and in the form of an open mesh construction having knitted stitches of lesser stitch density than the knitted stitches of said first section to permit the passage of light and ventilating air therethrough to provide ventilation for the user, the knitted stitches of said second section being of uniform stitch density throughout said second section, a third section directly contiguous with said second section and formed integrally with said second section, said third section being of warp knitted construction having knitted stitches of a stitch density greater than the stitch density of the warp knitted stitches of said second section and being of sufficient strength to support said fabric in suspended relation with a supporting structure, said first, second and third sections being constructed entirely from the same yarn materials to impart to said fabric uniform dyeing, wearing and washing characteristics, and means associated with the third section for suspending the entire fabric construction from a supporting structure.

4,377,196

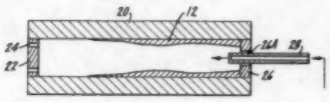
METHOD OF CENTRIFUGALLY CASTING A METAL TUBE

Igor Y. Khandros, Hoboken, N.J., assignor to Abex Corporation, New York, N.Y.

Continuation of Ser. No. 168,728, Jul. 14, 1980, abandoned. This application Sep. 21, 1981, Ser. No. 303,720

Int. Cl.³ B22D *13/02, 19/16, 21/02*

U.S. Cl. 164—66.1 **6 Claims**



1. A method of centrifugally casting a metal tube comprising:

pouring an easily oxidized metal onto the inside diameter of a rotating centrifugal mold and allowing the easily oxidized metal to solidify in the mold so that it has a thick section at one end of the mold, tapering to a thinner section;

pouring a denser metal initially onto the thick section of the solidified metal while rotating the mold, the denser metal having a higher melting point than the easily oxidized metal thereby gradually remelting the easily oxidized metal and progressing down the length thereof as a protective blanket for preventing oxidation of the easily oxidized metal at the pouring temperature of the denser metal;

continuing rotation of the centrifugal mold until the easily oxidized metal is entirely covered by the blanket and also until the easily oxidized metal has moved radially inward through the denser metal to reach the inside surface of the tube, whereby the easily oxidized metal has been prevented from undergoing objectionable oxidation; and

allowing the metals to solidify to complete a centrifugally cast tube of both metals characterized by a centrifugal casting having at and near the outside surface a first zone having a high concentration of the denser metal alloyed with a low concentration of the easily oxidized metal; a second zone having a higher concentration of the easily oxidized metal, higher than in the first zone, alloyed with a lower concentration of the denser metal, lower than in the first zone, located at and near the inside surface; and a transition zone between the other two zones where the concentration of the easily oxidized metal is continuously increasing radially in the direction of the inside surface.

5. A method according to claim **1** including the step between pouring the easily oxidized metal and pouring the denser metal of displacing air from the interior of the mold with a nonoxidizing gas, confining the body of nonoxidizing gas to the interior of the mold, and providing for escape of the body of nonoxidizing gas when pouring the denser metal.

4,377,197

APPARATUS AND METHOD FOR CASTING LEAD INTO PLASTIC FOR SIDE TERMINAL BATTERIES

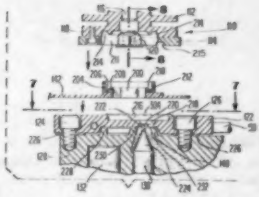
Terry Oxenreider, Wernersville; Donald A. Duesterhoeft, Robesonia, and Edgar M. Erb, Lancaster, all of Pa., assignors to General Battery Corporation, Reading, Pa.

Division of Ser. No. 27,656, Apr. 6, 1979, Pat. No. 4,284,122, which is a division of Ser. No. 753,835, Dec. 23, 1976, Pat. No. 4,158,382. This application Feb. 11, 1981, Ser. No. 233,483

The portion of the term of this patent subsequent to Jun. 19, 1996, has been disclaimed.

Int. Cl.³ B22D *17/04, 19/00*

U.S. Cl. 164—112 **13 Claims**



9. A method for casting a lead-alloy battery terminal connector through an aperture in a plastic battery case, comprising the steps of:

(a) providing a plastic battery case having an aperture in a wall of said case;

(b) positioning a plurality of mold means to surround said aperture on either side of said wall to form a die mold and to define a mold cavity;

(c) slidingly engaging a threaded insert used in forming portions of said connector with insert positioning means operatively associated with one of said mold means and located with said mold cavity;

(d) injecting molten lead under pressure into said mold cavity through an opening in one of said mold means;

(e) venting gases from said mold cavity to the atmosphere during the injecting through a plurality of openings provided in one of said mold means and disposed along the interface of said mold means with said wall; and

(f) automatically, slidingly releasing said insert from said insert positioning means, releasing said insert in said connector.

4,377,198

PASSIVE, RECYCLABLE COOLING SYSTEM FOR MISSILE ELECTRONICS

John R. Welling, Scottsdale, Ariz., and Donald L. Mattox, Huntsville, Ala., assignors to Motorola Inc., Schaumburg, Ill.

Filed Oct. 14, 1980, Ser. No. 196,903

Int. Cl.³ F28F *13/00*

U.S. Cl. 165—32 **8 Claims**

1. In an air-launched missile having a skin portion, apparatus comprising:

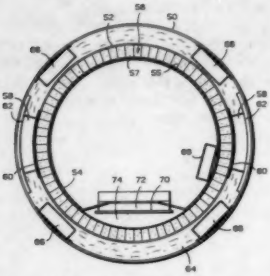
a first shell internal to said portion of skin and defining a first space therebetween, said first shell being heat conducting;

a second shell internal to said first shell and defining a second space therebetween and a third space interior to said second shell, said second shell being heat conducting;

unidirectional conduction means for conducting heat from at least one heat input portion to at least one heat output

portion and for preventing heat conduction from said at least one heat output portion to said at least one heat input portion, said at least one heat input portion being in intimate thermal contact with said first shell and said at least one heat output portion being in intimate thermal contact with said skin portion;

means for insulating said first shell from said skin portion, said insulating means occupying at least a portion of said first space not occupied by said unidirectional conduction means;



means for distributing beat, said heat distributing means comprising a plurality of heat conducting partitions extending from said second shell to said first shell and defining in said second space a plurality of closed cells;

means for storing heat, said heat storing means comprising a quantity of a material having a high heat of fusion, said heat storing means occupying at least a portion of said second space in said plurality of closed cells; and

electronic components occupying said third space and being in intimate thermal contact with said second shell.

4,377,199

COMPONENT FOR A HEAT EXCHANGER

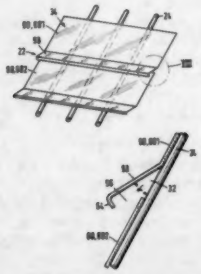
Uwe Heidtmann, Nussloch, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed Nov. 8, 1979, Ser. No. 92,644

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1978, 2848797

Int. Cl.³ F24J 3/02; F24F 1/32

U.S. Cl. 165—47 **10 Claims**



1. Component for a heat exchanger which exchanges heat between the environment and a liquid, having at least one tube for receiving the liquid, and at least one heat exchange surface heat-conductively connected to the tube, the heat exchange surface comprising a multiplicity of substantially flat plate elements having upper surfaces and lower surfaces fastened to the tube, said plate elements being disposed in a row side by side and overlapping each other in adjoining regions, in said adjoining overlapping regions one plate element having a planar part with an end and the other plate element having a bent-up part adjacent a flat part being fastened to the tube, said bent-up part of said other plate element overlapping said planar part of said one plate element forming a gap therebetween, said end of said planar part of said one plate element being spaced from said flat part of said other plate element fastened to the tube defining an interspace therebetween, said gap and interspace forming an air flow path from the upper surface to the lower surface of said plate elements.

4,377,200

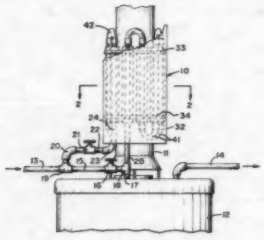
APPARATUS FOR RECOVERING WASTE HEAT FROM EXHAUST GAS FLOWING THROUGH AN EXHAUST PIPE

George A. Kochanowski, 1640 S. Surrey La., Lake Forest, Ill. 60045

Filed Mar. 23, 1979, Ser. No. 23,148

Int. Cl.³ F28F 3/12

U.S. Cl. 165—76 **5 Claims**



1. An assembly for mounting about a duct of arcuate cross-section adapted to transport hot waste combustion gases, for recovering waste heat therefrom, comprising:

a. a plurality of thermal conduction members formed of solid extruded metal mounted side by side circumferentially around said duct, each of said thermal conduction members mounted longitudinally along said duct and having:

(1) a longitudinal surface which is transversely concavely arcuate and of substantially the same curvature in cross-section as that of said duct and adapted to be positioned in engagement with the surface of said duct,

(2) a longitudinal channel opposite said concavely arcuate surface having a bottom which is concavely arcuate in cross-section and having a pair of spaced-apart lateral fins,

b. a plurality of water pipes each having an outer surface of substantially the same curvature in cross-section of the bottoms of the channels of said thermal conduction members, one water pipe being disposed in the bottom of each of the said channels, in close contact engagement with the bottoms of said channels, the fins of each thermal conduction member being crimped over the water pipe contained therein and in contact engagement with substantially the entire surface thereof, and tightly securing said water pipe to said thermal conduction member,

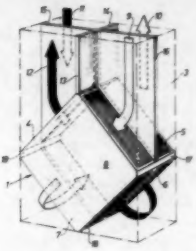
c. a plurality of U-shaped pipes connecting the ends of adjacent water pipes to provide a single continuous water conduit, said water conduit having means at one end adapted to be connected to a water source, and means at the other end adapted to be connected to the water inlet of said water heater.

4,377,201

ARRANGEMENT IN A HEAT RECOVERY UNIT

Rolf A. S. Kruse; Karl A. L. Gustavsson, and Karl A. Jansson, all of Enköping, Sweden, assignors to Aktiebolaget Bahco Ventilation, Enköping, Sweden

Filed Mar. 5, 1981, Ser. No. 240,976
Claims priority, application Sweden, Apr. 17, 1980, 8002896
Int. Cl.³ F28F 9/22
U.S. Cl. 165—76 7 Claims



1. An arrangement in a heat recovery unit adapted for installation in a cooking cupboard or the like space in a dwelling, the unit having within a casing a lamella heat exchanger placed on one corner edge such that two of its surfaces face upwards and two face downwards, said surfaces being the defining surfaces of the openings of passages through the heat exchanger, which has its end walls oriented in vertical planes, whereby said heat exchanger is adapted for heating outside or fresh air serving as supply air by removing heat from exhaust air departing from the dwelling, characterized in that four vertical wall portions, together forming a cross in horizontal section, are adapted above the heat exchanger and connect to it such that two of the wall portions follow a boundary line between both said upwardly facing defining surfaces on the heat exchanger while both the other of the wall portions respectively divide the same defining surfaces so that the four wall portions form four chambers, the heat exchanger having three additional boundary lines between adjacent defining surfaces with each boundary line making a sealing connection with the contiguous wall of the casing, the first chamber constituting an inlet chamber for the exhaust air from the dwelling, the second an outlet chamber for such exhaust air cooled in the heat exchanger, the third an inlet chamber for untreated supply air in the form of fresh or outside air and the fourth an outlet chamber for the supply air heated in the heat exchanger, whereby the heat recovery unit is upwardly connectable to necessary ducting to and from separate rooms in the dwelling and to and from the outside air the heat exchanger also being air-tightly sealed against the casing with its end walls sealingly engaging against the back and front of the casing, whereby said heat exchanger, which is formed as a unit and is insertable and removable by opening or removing the front, is divided into two portions, each of which has a cross-streams relationship between supply air and exhaust air and has its passages for supply air and exhaust air disposed in series with the corresponding passages of the other portion.

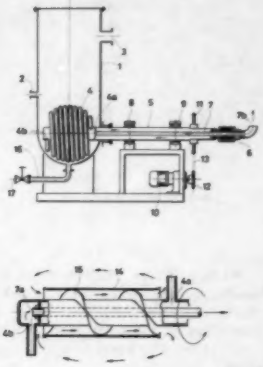
4,377,202

ROTARY HEAT EXCHANGE APPARATUS PROVIDED WITH A SPHERICALLY COILED HEAT TRANSFER TUBE

Nobunosuke Nakamura, Nara, and Hisanori Kimoto, Kitakyushu, both of Japan, assignors to Fuji Kosan Kabushiki Kaisha, Kitakyushu and Seiwa Ltd., Osaka, both of, Japan

Filed May 26, 1981, Ser. No. 267,114
Int. Cl.³ F28D 11/04; F28F 5/06
U.S. Cl. 165—86 3 Claims

1. In a heat exchange apparatus for heating or cooling a fluid which comprises: a vessel; a rotary heat exchanger within said vessel, said rotary heat exchanger comprising a reflux-type, heat transfer, double-tube comprising an outer tube which is closed at the front end thereof and has a heat-transfer-medium inlet at the rear end thereof, an inner tube provided concentrically within said outer tube, the front end of said inner tube having an opening located near the closed front end of said outer tube, said outer tube having an annular partition around said opening, the rear end of said inner tube extending beyond the rear end of said outer tube and defining a heat-transfer-medium outlet, driving means for rotating said outer tube, a spherically coiled heat transfer bypass tube provided concentrically around said outer tube along a lengthwise part thereof, one end of said bypass tube communicating with said outer



tube at a location upstream of said partition, the other end of said bypass tube communicating with said opening of said inner tube located near the front end of said outer tube, said spherically coiled heat transfer bypass tube being formed by spirally coiling or convoluting an elongated tube concentrically around said outer tube in a spherically-contoured shape, and a suction tube mounted concentrically on and surrounding said outer tube, said suction tube being open at its opposite ends and being located within the spherical space enveloped by said spherically coiled heat transfer bypass tube, said suction tube and said spherically coiled heat transfer bypass tube being integral with said outer tube so as to rotate in unison therewith, whereby a heat transfer medium can flow in series through said outer tube, said spherically coiled bypass tube and said inner tube, in that order.

4,377,203

RADIATOR EQUIPPED WITH A CENTRIFUGAL FAN

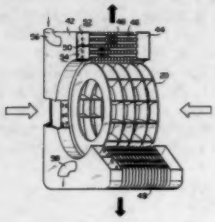
Kikuo Ejima, Ischara, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 18, 1981, Ser. No. 264,444
Claims priority, application Japan, May 20, 1980, 55-68223[U]; May 20, 1980, 55-68224[U]; May 21, 1980, 55-68736[U]; May 21, 1980, 55-68737[U]; May 21, 1980, 55-68738[U]
Int. Cl.³ F28D 1/04; F01P 3/18
U.S. Cl. 165—125 9 Claims

1. A cooling arrangement for vehicle engines, comprising:
a centrifugal fan mounted on a vehicle for rotation about an axis substantially parallel to the longitudinal axis of said vehicle; and
a radiator assembly mounted on said vehicle around the periphery of said fan, said radiator assembly comprising:
a first tank arranged at one end of said fan, said first tank having an annular inner face and a substantially rectangular outer face and having further formed therein a partition wall separating said first tank into a first and a second

chamber, said first chamber being connected to an inlet pipe for engine coolant and said second chamber being connected to an outlet pipe for engine coolant;

a second tank arranged at the other end of said fan, said



second tank having an annular inner face and a substantially rectangular outer face; and

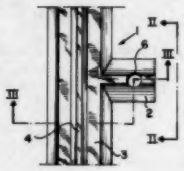
a plurality of tubes interconnecting said first and second tanks, each of said tubes having a plurality of fins formed thereon.

4,377,204

PLATE HEAT EXCHANGER

Karl B. V. Johansson, Helsingborg, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Apr. 30, 1981, Ser. No. 258,930
Int. Cl.³ F28F *3/00*
U.S. Cl. 165—166 **8 Claims**



1. In combination with a heat exchange plate having a pressed groove defining a sealing area, a gasket having a part adapted to seal in said groove, the gasket being adapted to seal against an adjacent heat exchange plate to define a heat exchange area of each plate, the gasket having fastening points spaced from each other and located outside the sealing area defined by said groove, and means for securing the gasket to the plate at said fastening points.

4,377,205

LOW PRESSURE COMBUSTOR FOR GENERATING STEAM DOWNHOLE

William B. Retallick, 1432 Johnny's Way, West Chester, Pa. 19380

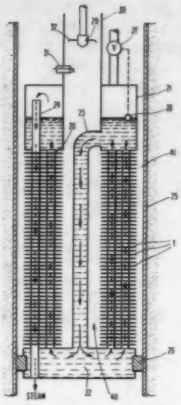
Filed Mar. 6, 1981, Ser. No. 241,095
Int. Cl.³ E21B *43/24*
U.S. Cl. 166—59 **4 Claims**

1. A catalytic combustor for generating steam at or near the bottom of an oil well, comprising:

a stack of rings made from sheet metal, the stack having a hollow core defined by central holes in the rings,

the rings being spaced apart sufficiently to allow a fuel-air mixture to flow from the core of the stack outwardly between the rings,

the rings being coated with a catalyst, and



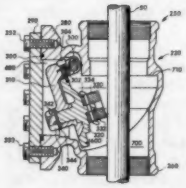
the stack of rings being traversed by steam generating tubes that are positioned around the core of the stack.

4,377,206

WELL BLOWOUT PREVENTION DEVICE

Roland A. Chambers, Waumsutter, Wyo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Oct. 31, 1980, Ser. No. 202,539
Int. Cl.³ E21B *33/06, 34/02*
U.S. Cl. 166—97 **5 Claims**



1. A well blowout prevention device (200) for a sucker rod well pumping system (10) on a well bore (80) for pumping fluid (100) contained in said well bore through a production-tee (30), said pumping system (10) having a reciprocating polish rod (50) connected through a stuffing box (70) to said production-tee (30), said device (200) comprising:

a fluid-tight body (220) connected below said stuffing box (70), said body (220) having a formed passageway (700) through which said polish rod (50) extends,

a pivotal valve (310, 320) disposed in said body (220), said valve being capable of occupying an open position and a closed position,

a wear block (330) on a portion of said valve (310, 320), one surface (500) of said wear block (330) abutting said polish rod, and

at least one counterweight (232) connected to said valve (310, 320) for biasing said wear block (330) against said polish rod (50) to normally maintain said valve (310, 320) in said open position, when said polish rod (50) separates from said stuffing box (70) and falls through said passageway (700) said counterweight (232) acting to force said valve (310, 320) into said closed position wherein said

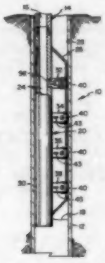
valve (310, 320) closes across said passageway (700) in fluid-tight engagement with said body (220), said closed valve being oriented in said passageway (700) so that any fluid (100) coming up from the well bore further biases said valve in said closed position.

4,377,207

TUBING ANCHOR

William M. Kofahl, Rte. 2, Box 297, Licking, Mo. 65542

Filed Nov. 2, 1981, Ser. No. 317,415
Int. Cl.³ E21B *23/06*
U.S. Cl. 166—212 9 Claims



1. A tubing string anchor for anchoring a tubing string having a passage therethrough in a well bore having walls, comprising:

an annular section forming a portion of the tubing string and having an internal passage aligned with the passage in the tubing string;

at least one roller slip rotatably mounted on said annular section for rolling frictional engagement with the walls of the well bore, said roller slip having a plurality of notches formed on the outer surface thereof;

at least one pawl mounted to said annular section for engagement with selected ones of said plurality of notches to resist rotational motion of said roller slip in at least one direction to anchor the tubing string within the well bore; and

engaging means for engaging said pawl with said selected ones of said plurality of notches.

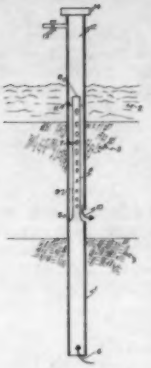
4,377,208

RECOVERY OF NATURAL GAS FROM DEEP BRINES

Guy R. B. Elliott; Nicholas E. Vanderborgh, both of Los Alamos, and Milton W. McDaniel, Cimarron, all of N. Mex.

Filed Nov. 28, 1980, Ser. No. 211,138
Int. Cl.³ E21B *43/25, 43/38*
U.S. Cl. 166—265 7 Claims

1. A method of recovering natural gas from solution in hot brines in which circulation of the brine and recovery of the dissolved natural gas is powered by the expansion of natural gas released from solution in the brine comprising: (a) injecting a gas into a wellpipe to displace brine, (b) releasing the injected gas, (c) allowing methane-containing brine to flow into a pumping system thereby releasing the natural gas, (d) maintaining a pressure of natural gas greater than the vapor pressure of



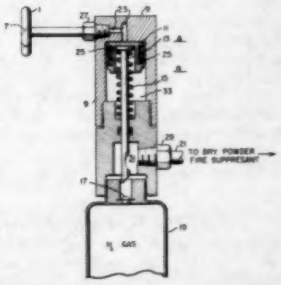
saturated steam over the brine at formation temperature, and (e) injecting the spent brine back into a formation.

4,377,209

THERMALLY ACTIVATED METAL HYDRIDE SENSOR/ACTUATOR

Peter M. Golben, Montvale, N.J., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jan. 27, 1981, Ser. No. 229,698
Int. Cl.³ A62C *35/02*
U.S. Cl. 169—26 4 Claims



1. A system employing a confined metal hydride material initially stored in a nongaseous state which senses an ambient fire and uses the heat therefrom to emit hydrogen in a gaseous state and to actuate the discharge of a fire suppressant material comprising:

a hollow thermal sensor used to sense the rise in temperature of ambient air, and said sensor being curved in configuration and closed on all sides except one and having a metal hydride material deposited in its hollow inner portion;

said sensor's metal hydride material while in a nongaseous state being capable of storing hydrogen gas at a given temperature range and releasing said hydrogen gas a second higher temperature corresponding to an ambient fire;

a housing with an inner cavity to receive a movable piston head, said housing and cavity being connected to said sensor at its opened side by a gas tight connection;

a movable piston head with an attached actuator mounted in the cavity of the housing, said head being moved by the

release of pressurized hydrogen gas from the metal hydride when at or above the second higher temperature, corresponding to an ambient fire;

biasing means to normally bias the piston and its actuator to a first position; and

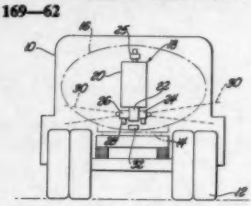
a container connected to said housing by a gas tight connection, said container having its own source of pressurized fluid and means capable of being actuated by the actuator of the piston's head to release its pressurized fluid from the container when the hydride has reached its second higher temperature and, as a result, causes the piston with its actuator to move to a second position.

4,377,210

FUEL TRUCK FIRE ESCAPE MECHANISM

Anthony J. Monte, 47660 Bluebird, Utica, Mich. 48087

Filed Feb. 20, 1981, Ser. No. 236,100
Int. Cl.³ A62C *35/12*
U.S. Cl. 169—62 **6 Claims**



1. In a flammable fuel transport vehicle comprising a cab for the driver and a fuel-containing tank behind the cab: the improvement comprising a fire suppressant mechanism located in the space between the cab and tank for covering the ground area alongside said space in the event that the vehicle should be accidentally turned on its side; said fire suppressant mechanism comprising an upright container for pressurized fire suppressant chemical, a first solenoid valve connected with the container for discharging the chemical toward the area at the right side of the vehicle, a second solenoid valve connected with the container for discharging the chemical toward the area at the left side of the vehicle, and electric switch means responsive to lateral tilting movements of the vehicle for selectively energizing the valve solenoids so that when the vehicle is lying on its right side only the first valve is opened, and when the vehicle is lying on its left side only the second valve is opened.

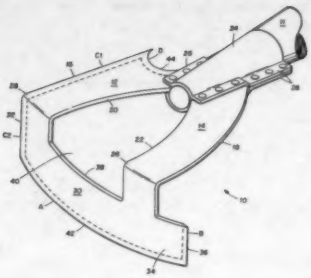
4,377,211

MULTI-PURPOSE GARDEN HOE

Raymond G. Voss, East Moline, Ill., assignor to Eagle Valley Manufacturing, Inc., Eldridge, Iowa

Filed Oct. 13, 1981, Ser. No. 310,453
Int. Cl.³ A01B *1/20*
U.S. Cl. 172—375 **9 Claims**

1. In a hand wieldable implement of the hoe type, the implement including a handle having a front end and a generally longitudinal axis, and a cutting head having forward and rear portions, the head rear portion being secured to the handle front end, the head forward portion including a first blade having a surface extending transversely both of said axis and of a first plane through said axis, the first blade having a first cutting edge formed along one margin thereof and lying in the surface of the first blade, the first cutting edge extending generally parallel to said first plane, the first blade also having opposite end margins extending transversely of said first plane, the improvement including second and third cutting edges, the second cutting edge being formed along one of the first blade end margins and lying in the surface of the first blade, one end of the second cutting edge adjoining one end of the first cutting edge at a first angle to form an exterior corner of the first blade, the head forward portion including a second blade having a surface and an exterior margin, said exterior margin adjoining the other end of the second cutting edge and extending rearwardly therefrom transversely of the surface of the first blade, the third cutting edge being formed along said exterior margin



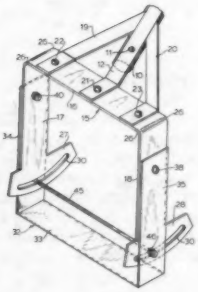
of the second blade and lying in the surface thereof, one end of the third cutting edge thereby adjoining said other end of the second cutting edge at a second angle.

4,377,212

PENDULUM ACTION CULTIVATING HOE

John R. Malson, Sr., 100 Toni Dr., Jacksonville, N.C. 28540

Filed Jan. 11, 1982, Ser. No. 338,420
Int. Cl.³ A01B *1/08*
U.S. Cl. 172—376 **2 Claims**



1. A hand-operated, pendulum action, cultivating hoe comprising:

(a) an elongated handle;

(b) an integral, vertically inverted, U-shaped, rigid support frame formed of plate metal comprising:

(i) a horizontal cross strap; and

(ii) a pair of similar shaped, downwardly-extending, laterally-spaced, opposed vertical side straps, the upper end portion of each said vertical side strap being formed as a strap-like continuation of one end of said cross strap and the lower end portion of each said vertical side strap being formed as a plate section in the same plane as the plane of and as an enlarged extension of the upper end portion of the vertical side strap of which it is a part and having an upwardly-curved arcuate slot formed therein;

(c) bracing means integrally connecting said elongated handle to said support frame cross strap in transverse perpendicular relation thereto and vertically angled such that when said support frame vertical side straps are vertical said handle is at a substantially 45° vertical angle with respect to the horizontal;

(d) an integral, upright, vertically-positioned, U-shaped,

rigid blade frame formed of metal strap, said blade frame comprising:

(i) a rectangular, ground-engaging, horizontal cross strap providing a blade member having forward and rearward upwardly beveled cutting edges formed on the long edges thereof; and

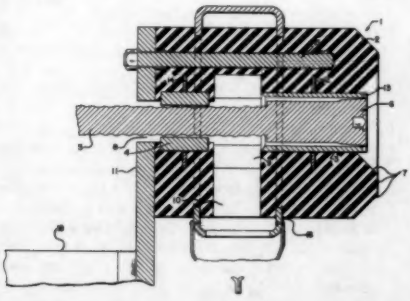
(ii) a pair of similar shaped, upwardly extending, laterally spaced, opposed vertical side straps, said blade frame vertical side straps being formed as respective strap-like continuations of the ends of said cross strap blade member and being pivotally mounted at their upper ends outwardly of and on the upper end portions of said support frame vertical side straps, said blade frame vertical side straps being arranged to swing on said support frame vertical side straps with the respective mating vertical side strap surfaces, including the surfaces of said support frame vertical side strap plate sections mating with said blade frame vertical side straps being in close opposing relation; and

(e) a horizontal cross bar extending between said blade frame vertical side straps and mounted with each respective outer end thereof passing through a respective said arcuate slot in a respective said support frame vertical side strap plate section and through a respective lower end of a said blade frame vertical side strap, said cross bar having means on the outermost ends thereof to prevent lateral axial movement thereof and residing at an elevated position above said blade frame blade member so that during use of said hoe and as said blade frame pivots on said support frame proximate the top thereof, said cross bar moves at said elevated position forward and rearward in said arcuate slots enabling said ground-engagable blade member to have limited off-center bidirectional swing on said support frame and dig into and cultivate the soil being hoed and said cross bar to serve as a depth gauge therefor in a selected short or long sweep synchronized with the natural pendulus motion of the arms of the user and said support frame vertical side straps serve to stabilize and oppose lateral movement of said blade frame vertical side straps.

4,377,213
DUAL BUSHING CENTRALIZER

Edward A. Bailey, Newport, and James F. Ordway, West Lebanon, both of N.H., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Sep. 1, 1981, Ser. No. 298,415
Int. Cl.³ E21C 7/02
U.S. Cl. 175—211 **12 Claims**



1. A sound insulating rock drill front centralizer comprising:

a stinger rigidly attached to the structure of a rock drill feed comprising a resilient elastomeric material having an axial bore therethrough allowing passage of a drill rod, said stinger also having a generally centrally located cavity intersecting with said axial bore and an aperture intersecting with said cavity allowing drilling effluent to exit said stinger in a direction generally perpendicular to said axial bore, and said stinger having a face toward a drilling surface capable of deformation providing a seal about a drill bit at the end of said drill rod when said drill bit engages the drilling surface;

a first bushing encapsulated within said elastomeric material for engaging the drilling surface and coaxially aligning the drill bit with said axial bore as the drill bit enters the drilling surface, said first bushing allowing a drill bit and drill rod passage therethrough, said first bushing encapsulated within said stinger between said cavity and said drilling surface;

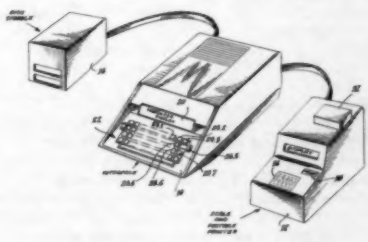
a second bushing encapsulated within said elastomeric material for coaxially aligning said drill rod with said axial bore in said stinger, said second bushing allowing said drill rod passage therethrough, said second bushing encapsulated within said stinger between said rock drill feed structure and said cavity whereby said second encapsulated bushing is maintained out of contact with said rock drill feed structure and said first encapsulated bushing; and

means for rigidly attaching said stinger to the structure of the rock drill feed.

4,377,214
METHOD AND APPARATUS FOR INTERFACING AN ELECTRONIC SCALE SYSTEM WITH A STORAGE MEDIUM

Gary G. Hansen, Greenwich, and Gary D. Cholakian, Norwalk, both of Conn., assignors to Pitney Bowes, Inc., Stamford, Conn.

Filed Feb. 10, 1981, Ser. No. 233,256
Int. Cl.³ G01G 19/40
U.S. Cl. 177—25 **17 Claims**



1. An interfacing device for an article weighing and postage generating system having an electronic postage weighing scale operative to produce transaction data signals on an output comprising:

a manually actuatable alphanumeric keyboard, means for communicating with a storage medium so that scale transaction data signals and keyboard entered data signals can be preserved and processed, a programmable memory, a data memory, an electronically actuated display, and means for carrying out instructions stored in the programmable memory, said interface further having a scale port connected to receive scale transaction data signals, a display output to drive said display, a keyboard input to receive manually inserted response signals from said keyboard and a storage medium port connected to transmit scale transaction signals and keyboard originating text signals to the storage medium;

said manually actuatable keyboard being connected to the keyboard input, with said electronically actuated display being connected to the display output and being of sufficient length to visually indicate readable inquiry signals and response signals from the actuation of the keyboard;

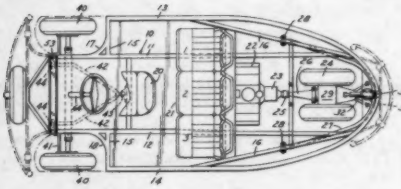
means for storing scale transaction data signals in the data memory;
means responsive to the storing of said scale transaction data signals for producing a prompt on the display representative of a request for additional text data signals pertinent to the stored scale transaction data signals;
means for storing in said data memory keyboard text data signals responsive to said display request; and
means for transmitting the scale transaction data and the keyboard text data signals from the storage medium port to said storage medium.

4,377,215

SUSPENSION SYSTEM FOR AUTOMOTIVE VEHICLES

Terence G. Hare, 21146 Caberfae Hwy. M-55, Wellston, Mich. 49689

Continuation of Ser. No. 126,570, Mar. 3, 1980, abandoned. This application Aug. 20, 1981, Ser. No. 294,443
Int. Cl.³ B62D *61/00*
U.S. Cl. 180—21 **12 Claims**



8. A vehicle comprising
a frame having a front end and a rear end,
a load area on said frame,
an engine mounted intermediate the front and rear ends of said frame,
closely spaced rear wheels resiliently mounted at the rear of said frame at a spacing less than the width of the frame,
a front axle,
steerable front wheels on said axle,
means for universally mounting said front axle on said frame for movement vertically and horizontally,
resilient means between said frame and front axle,
a steering column rotatably mounted on said frame,
means interconnecting said steering column and said front axle for causing said frame to tilt into a turn comprising a cross bar, spring means between said axle and cross bar, a suspension support overlying said cross bar, means resiliently connecting said suspension support to said frame, spaced shackle arms pivoted to said suspension support at one end and to said cross bar at the other end, each said shackle arm having a free end portion extending downwardly and flexible means connected to said free end portions and operable by operation of the steering column to swing said shackle arms to cause tilting of said frame in the direction of a turn.

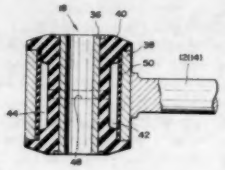
4,377,216

VIBRATION DAMPING BUSHING

Kenzo Ueno, Sayama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 12, 1980, Ser. No. 206,109
Claims priority, application Japan, Nov. 15, 1979, 54-148162
Int. Cl.³ B60B *35/12*
U.S. Cl. 180—73 TL. **9 Claims**

1. A vibration damping bushing comprising:
(a) an outer cylindrical sleeve;
(b) an inner cylindrical sleeve;
(c) an energy absorbing sleeve positioned about said inner sleeve and within said outer sleeve, said energy absorbing sleeve having first and second cavities positioned diametrically opposed from each other along the axis of force applied to said bushing, and having a connecting passageway interconnecting said cavities, and a vibration damping fluid contained within said cavities, whereby said passageway serves as a restrictive flow orifice to restrict the flow of the fluid



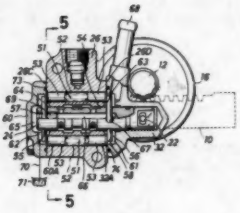
between said cavities, to thereby dampen the vibration of said outer sleeve with respect to said inner sleeve; and
(d) a fourth sleeve mounted within said outer sleeve to form a fluid-tight seal between said outer sleeve and said energy absorbing sleeve to thereby fluid-seal said cavities and interconnecting passageway from said outer sleeve.

4,377,217

POWER STEERING SYSTEM HAVING HYDRAULIC REACTION CHAMBERS

Masao Nishikawa, Tokyo; Takashi Aoki, Wako, and Yoichi Sato, Fujimi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1980, Ser. No. 162,650
Claims priority, application Japan, Jun. 27, 1979, 54-87802[U]
Int. Cl.³ B62D *5/06, 5/08*
U.S. Cl. 180—143 **16 Claims**



1. A power steering system comprising:
(a) a servo cylinder having a pair of hydraulic oil chambers defined therein by a piston for providing hydraulic assistance to the steering operation;
(b) a hydraulic pressure source for supplying hydraulic oil to said system;
(c) an oil reservoir;
(d) a four-way valve operatively connected between said hydraulic oil chambers and said hydraulic pressure source and oil reservoir, said four-way valve being movable from a neutral position thereof in response to steering torque applied to said power steering system for selectively connecting said pair of hydraulic oil chambers to said hydraulic pressure source and said oil reservoir, said valve supporting a pair of pins extending diametrically thereof and spaced axially from each other; and
(e) a pair of hydraulic reaction chambers operatively connected with said hydraulic pressure source, said hydraulic reaction chambers being disposed one on each side of and substantially parallel to said valve and each containing a pair of plungers and a spring interposed therebetween, said springs normally urging said four-way valve toward said neutral position thereof through said plungers, and

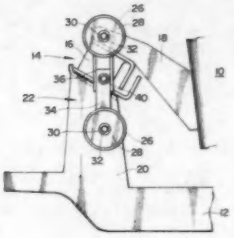
said plungers and said springs in said pair of hydraulic reaction chambers being held between said pair of pins.

4,377,218

METHOD AND APPARATUS FOR REDUCING ENGINE VIBRATION INDUCED VEHICLE CABIN NOISE AND RESONANCE

Masao Fukushima, Fuchu, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 19, 1980, Ser. No. 218,328
Claims priority, application Japan, Dec. 20, 1979, 54-166661
Int. Cl.[3] B60K 5/00
U.S. Cl. 180—300 8 Claims



7. In a vehicle having an engine and a chassis,

suspension means having a predetermined effective spring modulus for suspending said engine on said chassis;

means for increasing said effective spring modulus when said engine vibrates with a frequency lower than a predetermined frequency; and

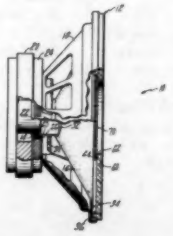
means for reducing said spring modulus when said engine vibrates at a frequency equal to or greater than said predetermined frequency.

4,377,219

LOUDSPEAKER HAVING APERTURED ACOUSTIC IMPEDANCE FRONTAL LOADING ELEMENT

John A. King, Martinsville, Ind., assignor to Harman International Industries, Northridge, Calif.

Filed Apr. 20, 1981, Ser. No. 255,400
Int. Cl.[3] H04R 7/00
U.S. Cl. 181—155 13 Claims



1. A direct radiating dynamic loudspeaker of the type having low mass diaphragm and magnet means, the improvement comprising:

a substantially planar acoustic impedance means positioned in front of and covering the projected frontal area of said diaphragm, said impedance means being a nonrigid, fibrous air-permeable material supported only at the periphery thereof;

said impedance means having an opening therein providing an acoustic mass; and

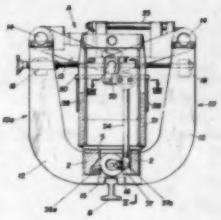
a second sheet of acoustically transparent material covering said opening and being bonded to said impedance means.

4,377,220

AUTOMATIC RAIL CLAMP

Aubrey C. Briggs, Carnegie, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed [illegible] 21, 1980, Ser. No. 152,136
[illegible]nt. Cl.[3] B61H 7/12
U.S. Cl. 188—44 9 Claims



1. In an automatic rail clamp having a supporting frame and confronting rail gripping jaw assemblies, one of which is at one side of the frame and the other at the opposite side of the frame, both jaw assemblies being fulcrummed to rotate about a common fulcrum shaft supported on the frame in a vertical plane midway between the two jaw assemblies in a direction parallel with the length of the rail to be gripped between them, each jaw assembly having a plurality of lever elements rotatably mounted one after the other along the common fulcrum shaft with the lever elements providing jaw portions located below said common fulcrum shaft and lever arms extending laterally and upwardly from said common fulcrum shaft for connection with operating means carried by the frame, the jaw portions of said plurality of lever elements of each jaw assembly having a common railhead gripping insert fixed thereto in such manner that when the lever arms of said two jaw assemblies are spread apart by said operating means, said inserts move toward each other to grip opposite sides of a railhead and, when said lever arms of the two assemblies are moved toward each other, the respective inserts move away from the railhead to release the grip of the jaw assemblies, the invention comprising:

(a) means mounting said common fulcrum shaft in the frame for rotation about its own axis,

(b) means for permitting rotation of the common fulcrum shaft in one direction and holding it against rotation in the opposite direction,

(c) means rotating said common fulcrum shaft through an arcuate increment of rotation when the amplitude of movement of the lever arms exceeds a predetermined amount as said gripping inserts wear thinner with repeated operations of the clamp; and

(d) adjustment means responsive to each increment of rotation of said common fulcrum shaft for adjusting the relative position of said jaw assemblies to accommodate for the wear on said inserts and to reduce the amplitude of movement of the lever arms so that the common fulcrum shaft is not incrementally rotated again until the inserts have worn sufficiently to cause the amplitude of movement of the lever arms to again exceed said predetermined amount, said adjustment means including, two series of eccentrics on the common fulcrum shaft offset from the axis of rotation thereof, the eccentrics of one series being 180° out of phase with those of the other series, said eccentrics being positioned one after the other along the common fulcrum shaft with the lever elements of one jaw assembly being fulcrummed about the eccentrics of one series and the lever elements of the other jaw assembly being fulcrummed about the eccentrics of the other series in such manner that with each increment of rotation of the

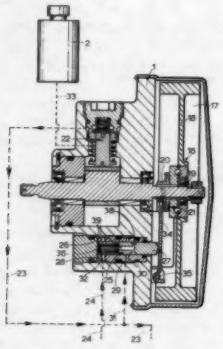
common fulcrum shaft, the eccentrics shift the centers of rotation of the lever elements on their respective fulcrums in opposite directions with respect to the axis of rotation of the common fulcrum shaft.

4,377,221

HYDRAULIC ANTI-SKID SYSTEMS FOR VEHICLE

Glyn P. R. Farr, Warwickshire, England, assignor to Girling Limited, Birmingham, England

Division of Ser. No. 941,938, Sep. 13, 1978, Pat. No. 4,260,201.
This application Dec. 16, 1980, Ser. No. 216,792
Claims priority, application United Kingdom, Sep. 15, 1977, 38501/77
Int. Cl.³ B60T 8/093
U.S. Cl. 188—181 A 7 Claims



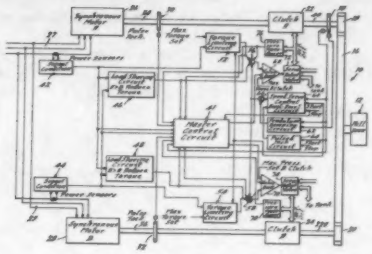
1. Anti-skid sensing means for a vehicle braking system of the type comprising a fluid pressure-operable brake for braking a wheel, a supply of fluid under pressure for operating said brake, a modulator assembly for modulating said supply of fluid to said brake in accordance with a skid signal from anti-skid sensing means, said anti-skid sensing means comprising a shaft adapted to be driven by said wheel, a flywheel assembly including relatively movable parts, all said parts being mounted on said shaft for full rotation with respect to said shaft, drive means including a clutch and through which said flywheel assembly is driven from said shaft, camming means responsive to relative angular movement between said shaft and said flywheel assembly to produce a skid signal for operating said modulator assembly to reduce the pressure of fluid supplied to said brake when the deceleration of said shaft relative to said flywheel assembly exceeds a predetermined value, said skid signal comprising relative axial movement between said shaft and said flywheel assembly, common biassing means for biassing both said clutch and said camming means, a reaction means for transmitting thrust from said biassing means to said flywheel assembly, and means for positively driving said reaction means from said wheel at all times, wherein said biasing means exerts a biassing force on said clutch and camming means which prevents said skid signal from being produced unless said flywheel assembly has generated sufficient torque to overrun said shaft by a predetermined amount and to maintain said skid signal by permitting said flywheel assembly to overrun said shaft against said clutch.

4,377,222

DRIVE SYSTEM

Gordon M. Sommer, Boca Raton, Fla., assignor to Sommer Co., Warren, Mich.

Filed Jul. 16, 1979, Ser. No. 58,106
Int. Cl.³ F16D 25/11, 67/00; B60K 41/00; F16D 43/30
U.S. Cl. 192—0.02 R 32 Claims



1. A multiple drive system for driving a single rotational member comprising:

first and second motor means;

first and second clutch means for drivingly connecting said motor means to said rotational member; and

control means for controlling operation of said first and second clutch means, said control means including

first and second actuating means operative to apply fluid actuating pressure to said first and second clutch means respectively,

speed control means operatively connected to said first and second actuating means, and

load balancing means operatively connected to said first and second actuating means,

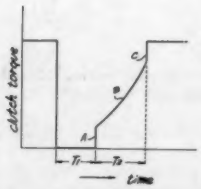
said control means being operative to control said first and second actuating means so as to progressively increase said fluid pressure to said first and second clutch means at a predetermined rate whereby said rotational member may be accelerated from a standing condition and said load balancing means being operative to control said first and second actuating means so as to maintain substantially equal torque loading on said first and second motor means continuously during acceleration of said rotational member.

4,377,223

ELECTRO-MAGNETIC CLUTCH CONTROL SYSTEM FOR AUTOMOBILES

Ryuzo Sakakiyama, Tokyo, and Shoichi Usunami, Mitaka, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 9, 1981, Ser. No. 223,675
Claims priority, application Japan, Jan. 10, 1980, 55-1558
Int. Cl.³ F16D 27/00; B60K 41/22
U.S. Cl. 192—3.58 3 Claims



1. A system for controlling an electro-magnetic clutch having a magnetizing coil comprising gate circuit means for pro-

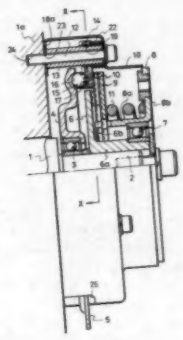
ducing a signal by clutch shift lever operating signal; first circuit means for producing a clutch engaging period signal in response to an output of said gate circuit for a predetermined clutch engaging period; second circuit means for producing a first control signal and a second control signal in dependency on the mode of said clutch engaging period signal; and control circuit means for maintaining the current flowing through said magnetizing coil at a lower value in response to said first control signal for providing a small clutch torque of the clutch and maintaining the current at a rated value in response to said second control signal for completely engaging the clutch.

4,377,224

CLUTCH BRAKE ASSEMBLY

Terasu Takata; Makoto Hangai, and Yasuo Yokoyama, all of Kiryu, Japan, assignors to Ogura Clutch Co., Ltd., Kiryu, Japan

Filed Sep. 19, 1980, Ser. No. 188,950
Claims priority, application Japan, Oct. 11, 1979, 54-131227
Int. Cl.³ F16D *41/24*
U.S. Cl. 192—18 R **7 Claims**



1. A clutch brake assembly comprising:

an annular operating element externally operable for rotational movement through a predetermined circumferential angle;

a cylindrical input hub arranged concentrically of said operating element and rigidly fitted on an output shaft of a rotary machine as a driver;

an output hub having an axially extending boss portion and arranged concentrically of said output shaft for rotation relative to said output shaft;

an annular friction plate splinefitted on said boss portion of said output hub for rotational movement together with said output hub and for axial displacement relative to said output hub for frictional engagement with said input hub;

urging means resiliently urging said friction plate toward said input hub;

an annular brake element interposed between said operating element and said friction plate for axial displacement into frictional engagement with said friction plate;

mounting means for said brake element for permitting axial displacement of said brake element and prohibiting circumferential displacement of said brake element,

said mounting means including a plurality of bolts held stationary and arranged at circumferentially spaced locations of said brake element and disposed axially of the clutch brake assembly; and a plurality of sleeves each fitted on an associated one of said bolts, said brake element being fitted on said sleeves for axial displacement along said sleeves; and

a plurality of balls rollingly held between said operating element and said brake element;

said operating element including a plurality of first grooves formed in a side surface thereof facing said brake element at circumferentially spaced locations, said brake element including a plurality of second grooves formed in a side surface thereof facing said operating element at circumferentially spaced locations, said first and second grooves extending circumferentially, respectively, of said operating element and said brake element, at least one of said first and second grooves each having a depth gradually decreasing from one end thereof toward the other end thereof, said balls each being engaged in mutually facing ones of said first and second grooves, whereby axial displacement of said brake element in a direction toward said operating element causes frictional engagement of said input hub with said friction plate to thereby permit transmission of torque from said input hub to said output hub, and axial displacement of said brake element in a direction away from said operating element causes disengagement of said friction plate from said input hub to thereby interrupt said torque transmission and simultaneously causes frictional engagement of said brake element with said friction plate to thereby cause braking of said output hub;

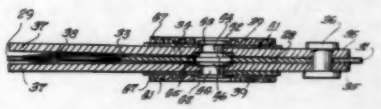
said annular brake element comprising an annular plate having opposed side surfaces, one side surface of said annular plate being disposed for frictional engagement with said friction plate and the other side surface of said annular plate being disposed in facing relation to said operating element via said balls interposed therebetween.

4,377,225

CLUTCH DRIVEN PLATE ASSEMBLY WITH VARIABLE FRICTION AREA

Thaddeus Lech, Jr., Sterling Heights, and Richard T. Popchock, Lake Orion, both of Mich., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 17, 1980, Ser. No. 207,827
Int. Cl.³ F16D *13/69*
U.S. Cl. 192—107 C **14 Claims**



1. A clutch driven plate comprising a generally circular plate having a plurality of circumferentially equally spaced radially extending lobes on the periphery thereof, a pair of separate oppositely disposed support plates secured to each lobe on the opposite surfaces thereof, each support plate having at least one friction pad secured thereto, and cushioning means between said friction pads to provide for a variable friction contact area as clutch engagement proceeds from initial engagement of a trailing edge of each pad with the engaging surfaces of a flywheel and pressure plate of a clutch assembly, said cushioning means being offset from the center of the friction pads so that the trailing edge of each pad makes initial contact.

4,377,226

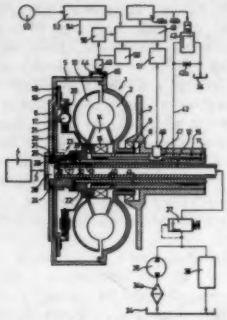
DEVICE CONTROLLING THE BRIDGING OF A HYDRODYNAMIC TORQUE CONVERTER

Claude Chevalier, Jouars-Pontchartrain; Jean-Marie Bouvet, Boulogne-Billancourt, and Jean P. Parthuisot, Rueil-Malmaison, all of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jun. 11, 1980, Ser. No. 158,549
Claims priority, application France, Jun. 13, 1979, 79 15191; Mar. 19, 1980, 80 06167
Int. Cl.³ F16D *33/00*
U.S. Cl. 192—3.3 **24 Claims**

1. A transmission device comprising: input and output

means, a housing drivingly connected to said input means and defining a main chamber, a hydrodynamic torque converter means disposed within said main chamber and having an impeller member drivingly connected to said housing, a turbine member located within said main chamber, and means defining a clutch assembly drivingly connected for rotation with said turbine member and capable of frictionally engaging said input means, said clutch assembly having walls defining a clutch



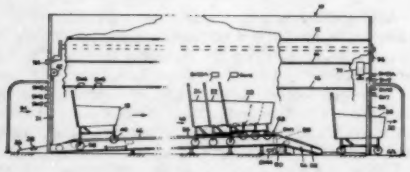
disengagement chamber in said housing and including a piston movable in response to differential pressure between said disengagement chamber and said main chamber; means defining a hydraulic circuit including a pressure control valve means for providing a substantially constant pressure unidirectional fluid source; and control means operable in response to a pressure change in one of said chambers for producing an opposite pressure change in the other said chamber.

4,377,227

STORAGE OF HAND-PROPELLED VEHICLES

Don L. Sandford, 28, Station La., Offord Clony, Huntingdon, Cambs., England

Filed Dec. 17, 1980, Ser. No. 217,211
Int. Cl.³ G07F 7/10
U.S. Cl. 194—4 R **12 Claims**



1. A storage facility for storing independently movable and stackable trolleys, comprising:

an inlet through which trolleys can be introduced one at a time,

an outlet through which trolleys can leave the storage facility one at a time,

a conveyor means for conveying trolleys introduced through the inlet in a direction towards the outlet to stack an introduced trolley with any previously introduced trolleys remaining within the facility,

means for releasing trolleys one at a time from the remote end of the stack through the outlet,

means for sensing that the facility is empty and for providing an indication of the empty condition,

sensing means for generating a warning signal when the facility is full and for indicating the full condition, and

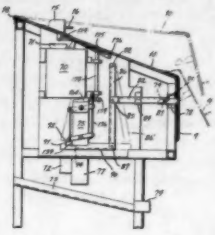
gates at the inlet which are locked shut when a full condition is sensed.

4,377,228

COIN CONTROLLED SINGLE MANUAL VEND NEWSPAPER VENDOR

Peter Ostermann, Sunnyvale, Calif., assignor to Hickey-Mitchell Company, St. Louis, Mo.

Filed Aug. 17, 1981, Ser. No. 293,380
Int. Cl.³ G07F 5/08
U.S. Cl. 194—54 **12 Claims**



1. A vendor for newspapers or the like comprising a housing for containing a vertical stack of newspapers, means for lifting said stack for presentation of successive newspapers of said stack at a vend position for being vended through a vend throat during a vend cycle, characterized by means for causing automatic alignment of newspapers with said throat regardless of non-uniform thickness of individual newspapers of said stack, a door for providing customer access to said throat for permitting an uppermost newspaper from atop said stack to be withdrawn through said throat, a coin mechanism within the housing, and door release means interconnecting said door with said coin mechanism for permitting opening of said door upon customer insertion of a proper coin combination corresponding to the vend price for each newspaper, and single vend control means for blocking customer withdrawal of a subsequent newspaper through said throat during said vend cycle in response to customer withdrawal of a first single newspaper through said throat and comprising a latch, a latching mechanism biased for movement from a latched position to unlatched position when released by said latch, a blocking member driven by release of said latching mechanism for movement from a first position free of said throat to a second position within said throat blocking withdrawal of a second newspaper during said vend cycle, a trigger within said throat for releasing said latch upon customer withdrawal of a newspaper through said throat while said door is open, and means for relatching said latching mechanism upon closure of said door.

4,377,229

APPARATUS FOR CONVEYING COPY SHEET FOR ELECTROPHOTOGRAPHIC COPYING MACHINE

Kiyoshi Miyashita, Hachioji; Tatuo Takizawa, Sagamihara; Kazuo Sugawa, Saitama, and Masaji Nishikawa, Hachioji, all of Japan, assignors to Olympus Optical Company Ltd., Tokyo, Japan

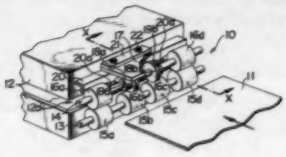
Filed Sep. 8, 1980, Ser. No. 184,668
Claims priority, application Japan, Sep. 28, 1979, 54/134762[U]; Apr. 25, 1980, 55/057030[U]
Int. Cl.³ B65G 45/00
U.S. Cl. 198—494 **7 Claims**

1. An apparatus for conveying a copy sheet for an electrophotographic copying machine, comprising:

a plurality of pairs of conveying rollers fixedly mounted on a pair of vertically aligned support shafts and abutting against each other to hold and convey a copy sheet therebetween which carries an unfixed toner image; and

a plate-shaped cleaning and charging member disposed in direct abutment against the peripheral surface of one or more of said conveying rollers which are arranged to contact the unfixed toner image on the copy sheet, said

plate-shaped cleaning and charging member operating to slidingly contact and thereby charge said one or more conveying rollers to the same polarity as the polarity of



the toner by triboelectricity to repel the deposition of toner on said one or more conveying rollers and to clean said one or more conveying rollers if any toner is deposited thereon.

4,377,230

PROCESS AND A DEVICE FOR THE DISTRIBUTION OF A CONVEYED FLOW

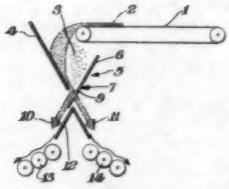
Wolfgang Bürkner, Darmstadt, Fed. Rep. of Germany, assignor to Carl Schenck AG., Fed. Rep. of Germany

Filed Sep. 25, 1980, Ser. No. 190,506

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1979, 2942163

Int. Cl.³ B65G *11/20, 47/44*

U.S. Cl. 198—525 **4 Claims**



1. An apparatus for the distribution of a conveyed flow of particles for the production of chipboard, fiberboard or the like by separation of the conveyed flow into two partial flows comprising a feeding device for continuously supplying the conveyed flow of particles, a discharge device disposed below the feeding device for continuously receiving the conveyed flow of particles and continuously discharging such particles, a generally planar rake-shaped distributing device disposed below the discharge device for continuously distributing the flow of conveyed particles received from the discharge device in two different directions, the rake-shaped distributing device comprising a plurality of spaced apart flat tongues with each adjacent pair of tongues separated by a slotted portion, the discharge device and rake-shaped distributing device being constructed and arranged to cause a portion of the conveyed flow of particles to penetrate only the slotted portions of the rake-shaped distributing device to thereby produce flow in one direction and to cause another portion of the conveyed flow of particles to flow along the flat tongues in a different direction.

4,377,231

MODULAR MERCHANDISE DISPLAY TOWER

Thomas V. Murphy, c/o Design Productions, P.O. Box 318, Oradell, N.J. 07649

Filed Feb. 26, 1981, Ser. No. 238,376

Int. Cl.³ B65D *3/24;* A47F *1/04, 3/14;* B65D *5/50*

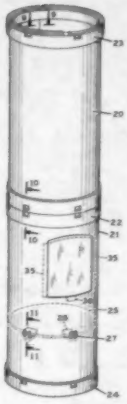
U.S. Cl. 206—44 R **9 Claims**

1. A multi-story tower structure for the display and dispensing of articles of merchandise which comprises,

(a) a plurality of cylindrical tower modules formed of clear transparent sheet-like plastic material having characteristics of substantial dimensional stability and at least sufficient flexibility to be capable of being pressed relatively flat,

(b) connecting ring formed of relatively rigid material and having opposed oppositely directed axially opening annular recesses of short axial length in relation to the axial length of said tower modules,

(c) a pair of said tower modules being received in and end portions thereof being lockingly engaged with said annular recesses to define a multi-story tower structure having



a continuous tubular interior for the reception of display merchandise or the like,

(d) generally circular bottom-forming means removably supported in one of said tower modules,

(e) one of said tower modules having a merchandise access opening therein at a level above said bottom-forming means,

(f) a merchandise dispensing spout extending outward and upward from said access opening to enable removal of display merchandise from said structure.

4,377,232

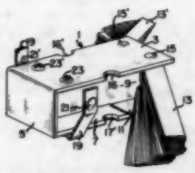
VENETIAN BLIND COLOR SAMPLER PACKET

Harold Reiss, New York, N.Y., assignor to Levolor Lorentzen, Inc., Lyndhurst, N.J.

Filed Dec. 30, 1980, Ser. No. 221,439

Int. Cl.³ B65D *23/12*

U.S. Cl. 206—44.11 **7 Claims**



1. A packet for displaying an assortment of Venetian blind sample slats in different colors comprising a casing having top, bottom and end portions, the casing being open on two sides and one end, two sets of a plurality of Venetian blind sample slats pivotally mounted completely within said casing adjacent said open end by fastening means connecting said sample slats within said top and bottom portions, each set being separated from one another by a central partition in the casing, whereby

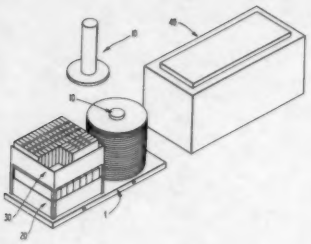
said sample slats may be extended from said casing for individual viewing purposes.

4,377,233

RECORD AND TAPE STORAGE UNIT

William J. Pahler, 91 Gilligan St., Wilkes Barre, Pa. 18702

Filed Oct. 5, 1981, Ser. No. 308,843
Int. Cl.³ B65D 85/30, 85/57
U.S. Cl. 206—310 2 Claims



1. A record and magnetic tape cassette storage and carrying case comprising

a. a generally rectangular base with a top surface and a bottom surface;

b. two circular depressions in the top surface with a diameter accomodatingly larger than the diameter of a forty-five R.P.M. record;

c. a rectangular depression in the bottom surface thereof;

d. at least one single shaft record spindle, each comprising a circular flat base of a diameter accomodatingly smaller than the circular depressions of (b) above and a single perpendicular shaft of cylindrical configuration;

e. at least one first rectangular box-shaped container with an open top and a closed bottom and further comprised of a circular ridge in the bottom thereof;

f. at least one second rectangular box-shaped container with a flat bottom surface and four vertical legs of a length at least as long as the height of the container;

g. a box-shaped cover of rectangular configuration comprised of an open bottom and a top surface further comprising a rectangular projection on said top surface accomodatingly smaller than the rectangular depression in the base; and

h. two strap-type carrying handles attached at each end to said base and disposed over the cover to be grasped by the user, and when said cover further comprises two knob-type handles to allow easy removal and placement of the cover relative to the base; and

whereby at least one record spindle can be placed on the base to receive records thereon; at least one first container can be placed on the base to receive cassettes; at least one second container can be placed over the first container to receive cassettes; the cover can be placed over the selected combination of spindles and boxes to complete the case and whereby one complete case can be stacked on another by co-operation of the cover projection of one case and the base depression in a second case.

4,377,234

MULTIPLE COMPARTMENT BANDING SLEEVE

Harold Kaplan, Franklin Square, N.Y., assignor to Halpak Plastics Inc., Oceanside, N.Y.

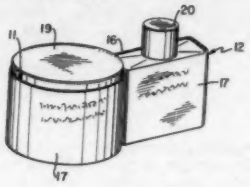
Filed Mar. 16, 1981, Ser. No. 244,011
Int. Cl.³ B65D 71/08, 73/00, 85/62
U.S. Cl. 206—432 5 Claims

1. A packaging sleeve comprising

(a) a pair of opposed walls of non-elastic, heat shrinkable thermoplastic sheet material hinged at opposite ends to form a flattened tube having a predetermined center line;

(b) a vertical welded seam parallel to and spaced from said center line joining said walls intermediate said ends;

(c) said vertical seam dividing said sleeve into two separate envelopes of unequal size; and



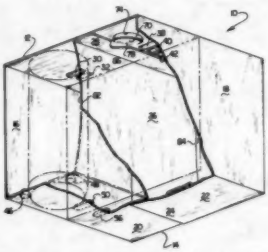
(d) said separate envelopes being adapted to be independently shrunk about two adjacent dissimilar objects with said seam disposed as an axis of interfacing to retain said objects in a predetermined generally abutting relationship.

4,377,235

FLAPLESS CARRIER FOR ARTICLES

Robert G. Carver, Ashland, Ohio, assignor to Don Coburn, Inc., Ashland, Ohio

Filed Oct. 30, 1980, Ser. No. 202,359
Int. Cl.³ B65D 73/00
U.S. Cl. 206—477 7 Claims



1. A carrier formed from a sheet material for receiving at least one article having two opposing end portions, said carrier comprising:

top and bottom walls;

a pair of side walls, each side wall being hingedly attached to each of said top and bottom walls to form a carrier sleeve; and

at least two three-dimensional retaining elements extending from said top wall engageable with an end portion of an article inserted into said carrier, for blocking the article from slipping out of said carrier, wherein each of said retaining elements comprises a mass of a cured adhesive that has adhered itself to said top wall.

4,377,236

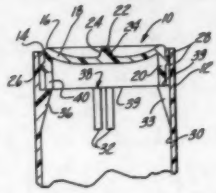
CHILD-RESISTANT PACKAGE WITH TILTING CLOSURE

Gary V. Montgomery, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Mar. 11, 1981, Ser. No. 242,447
Int. Cl.³ B65D 55/02, 43/04, 85/56
U.S. Cl. 206—540 12 Claims

1. A child-resistant package comprising: a container having a cylindrical inner wall forming a circular opening, a closure

having an annular seal disposed in said opening and acting radially outwardly to sealingly engage said cylindrical wall of said container to close said opening, a pair of circumferentially spaced fulcrums formed within said container and below said cylindrical wall and being engageable with said closure, said spaced fulcrums defining the ends of a pivot axis disposed transversely to and at one side of said axis of said opening, means for rotating said closure about the axis of said container,



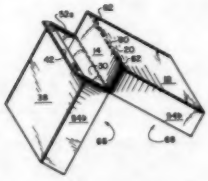
said closure having a portion alignable with the circumferential space between said fulcrums on said container upon rotation of said closure to a predetermined location, said closure having portions shaped to prevent axial lifting and being tiltable in said predetermined location from a closed position to an open position upon exertion of pressure in an axial direction on said closure at a location radially outwardly of said pivot axis to move portions of said seal out of engagement with said wall for removal of said closure from said opening in said container.

4,377,237

MULTIPLE COMPARTMENT CARTON

Thomas D. Pawlowski, Neenah, Wis., assignor to James River-Dixie/Northern, Inc., Greenwich, Conn.

Filed Mar. 10, 1981, Ser. No. 241,573
Int. Cl.³ B65D *17/40*
U.S. Cl. 206—630 **6 Claims**



1. A multiple compartment carton, comprising: a first compartment and a second compartment, said second compartment having a first line of weakness for opening said second compartment, said first line of weakness defining one edge of a cover on said second compartment, said first line of weakness, in the unopened carton, joining said cover to a carton wall panel; and protective means overlying said first line of weakness and affixed to said wall panel.

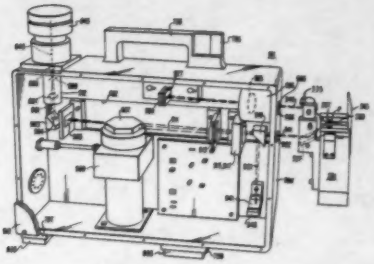
4,377,238

FLAW DETECTION AND EVALUATION

Robert S. Wilks, and Robert H. Sturges, Jr., both of Plum, Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 27, 1980, Ser. No. 181,567
Int. Cl.³ B07C *5/342*
U.S. Cl. 209—587 **13 Claims**

1. The method of inspecting fuel pellets for a nuclear reactor for flaws to determine if the shapes and the extents of the totality of the flaws in each pellet exceed predetermined maximum acceptable shape and extent, the said method including determining the area and perimeter of each flaw in the surface of said pellet to determine for each flaw a flaw quality index, dependent on each area and perimeter, summing the flaw quality indexes from all flaws in the surface of said pellet to



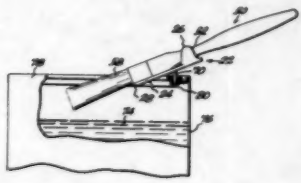
derive a surface-quality index, and evaluating said pellet based on its surface-quality index by comparing said index with the index corresponding to said acceptable shape and extent.

4,377,239

BRUSH RACK

James Jimae, 19 Harold St., Matraville, Sydney N.S.W., Australia

Filed Jan. 29, 1979, Ser. No. 7,360
Int. Cl.³ A47F *7/00*
U.S. Cl. 211—65 **3 Claims**



1. A one piece unitarily formed brush rack and removable support comprising:
a brush supporting land;
a saddle in the land, said saddle formed from the land and upwardly depending ears thereto;
a flared sill in the land opposite the saddle;
a tongue downwardly depending from the land;
support means; and at least one U-shaped parallel sided planar channel in the support means for removable engagement with the tongue.

4,377,240

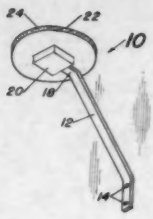
TOWEL SUPPORTING FIXTURE

Robert A. Kleps, 1142 S. Kenilworth, Oak Park, Ill. 60304

Continuation-in-part of Ser. No. 63,842, Aug. 6, 1979, abandoned. This application Nov. 21, 1980, Ser. No. 208,853
Int. Cl.³ A47F *5/08*
U.S. Cl. 211—87 **6 Claims**

1. A towel supporting fixture comprising in combination: support means for holding said fixture in a secure predetermined position; and a planar rigid plateau means having a uniformly disposed, upper, roughened, omni directional frictional surface for engaging a towel, said rigid plateau means and said frictional surface formed as a one-piece structure; and mounting means formed on the bottom of said rigid plateau means, said mounting means arranged for connection to said

support means to hold said rigid plateau means in spacial relation at said predetermined position; whereby said rigid plateau



means receives and holds a towel engaged with said towel engaging surface substantially completely by friction.

4,377,241

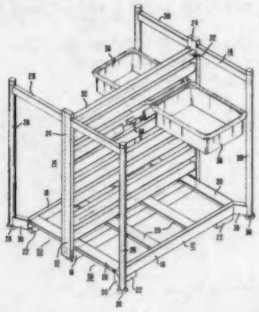
PALLET FRAME

Charles P. Schreiner, Saugatuck, Mich., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 4, 1980, Ser. No. 212,953

Int. Cl.³ B01D *27/10*

U.S. Cl. 211—133 **11 Claims**



1. A pallet frame for storing and transporting a plurality of material handling totes, said pallet frame comprising:

a bottom frame defining forklift receiving channels on the underside thereof and including an elongated central base member and base blocks at each corner thereof for supporting said pallet frame on a flat surface;

a pair of end frames mounted to said bottom frame, each of said end frames including a central load bearing member and a corner post at each end thereof, each of said corner posts being outwardly of the corner of said bottom frame and connected thereto; and

a plurality of support rails interconnecting said central load bearing members, each of said support rails being constructed and arranged to support a material handling tote.

4,377,242

ANTI-TAMPERING DEVICES FOR BOTTLES

Robert Snedker, Hemel Hempstead, England, assignor to Seagrams Distillers Limited, Paisley, Scotland

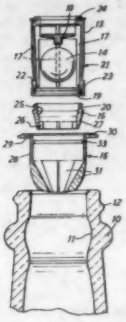
Filed Mar. 10, 1981, Ser. No. 242,352

Claims priority, application United Kingdom, Mar. 12, 1980, 8008356

Int. Cl.³ B65D *49/02*

U.S. Cl. 215—21 **13 Claims**

1. An anti-tampering device for insertion in a neck of a bottle, the device comprising a structure which contains a non-return valve adapted to permit the contents of the bottle to be poured out through the device but substantially to prevent flow into the bottle, said structure including an outer part and an inner part axially slidably relative to the outer part, the outer part including a portion which is radially outwardly expandable to grip the internal surface of the neck of the bottle by axial movement of the inner part relative to the outer part



in a direction into the bottle, said inner part including a body having inlet and outlet openings, a baffle formed as a single piece with said body and disposed in said outlet opening, a valve seat spaced from said baffle and positioned so as to movably trap a ball valve between said baffle and said valve.

4,377,243

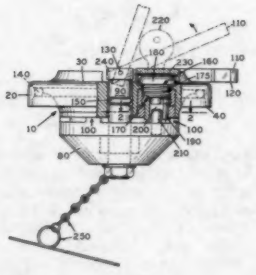
LOCK FOR FUEL TANK COVER

Francis Shaw, East Hampton, and David W. Jones, East Northport, both of N.Y., assignors to Shaw Aero Devices, Inc., East Hampton, N.Y.

Filed Oct. 30, 1981, Ser. No. 316,687

Int. Cl.³ B65D *55/14*

U.S. Cl. 220—210 **8 Claims**



1. In a filler cap assembly for a tank having an opening defined by a wall, the filler cap having a cover adapted to be received within the opening, a retaining member connected to the lower face of the cover for cooperating with the wall of the opening to fasten and unfasten the cap within the opening, and an operating handle connected to the retaining member for moving the retaining member between unfastened and fastened positions in the opening; the improvement comprising:

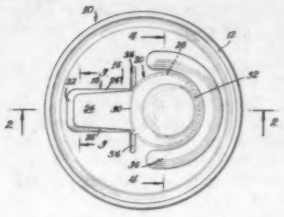
(a) lock means mounted in the cover and extending toward the retaining member; and

(b) cooperating means on the retaining member for engagement by the lock means when the retaining member is in the fastened position to prevent movement of the retaining member from the fastened position.

4,377,244
CONTAINER END AND CLOSURE THEREFOR

James J. Rossetti, Palmyra, Wis., assignor to Lakeshore Commercial Finance Corporation, Milwaukee, Wis.

Filed Nov. 16, 1981, Ser. No. 321,756
Int. Cl.³ B65D *41/32*
U.S. Cl. 220—268 21 Claims



1. A container end which is shaped to be attached at its periphery to a container body, said container end having a closure comprising:

a. an activator formed in the container end,

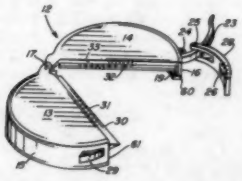
b. a lid formed in the container end adjacent said activator, said lid being defined by a frangible score line extending along the marginal edges of said lid, and

c. means connecting said activator to said lid, said connecting means including fulcrum means operable such that application of downward pressure on said activator causes said lid to sever at said score line and pivot upwardly from said container end about said fulcrum means.

4,377,245
CLOSURE FOR CONTAINER

Blyde L. Patty, 12 Yolo Dr., Prescott, Ariz. 86301

Continuation-in-part of Ser. No. 194,419, Oct. 6, 1980. This application Dec. 24, 1980, Ser. No. 219,934
Int. Cl.³ B65D *43/18*
U.S. Cl. 220—336 1 Claim



1. A closure for detachably fixedly engaging and sealing an open container, said closure comprising,

(a) a pair of substantially rigid members pivotally interconnected at a point on the periphery thereof for movement between at least two operative positions,

(i) a closed position with said members forming a generally circular top, each member having a face adjacent to an opposing face of the other said member when said members are in said closed position, and

(ii) an open position with said members rotated apart about said pivot point,

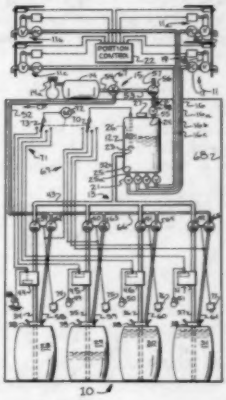
(b) a projecting depending substantially rigid collar member along an outer edge of each of said pivotally connected members, said outer edges generally defining the periphery of said circular top when said pivotally connected members are in said closed position, the inner surface of each of said collar members being adapted to sealingly engage said container when said pivotally connected members are in said closed position, and

(c) means for securing said pivotally connected members about said container in said closed position.

4,377,246
APPARATUS FOR DISPENSING A CARBONATED BEVERAGE

John R. McMillin, Maplewood, Minn., and Peter Strandwitz, Neenah, Wis., assignors to The Cornelius Company, Anoka, Minn.

Division of Ser. No. 1,027, Jan. 4, 1979, Pat. No. 4,305,527, which is a division of Ser. No. 806,136, Jun. 13, 1977, Pat. No. 4,143,793. This application May 11, 1981, Ser. No. 262,151
Int. Cl.³ B67D *5/54*
U.S. Cl. 222—56 1 Claim



1. Apparatus for concurrently and uninterruptedly dispensing a plurality of discrete servings of carbonated beverage while automatically switching from a just emptied to a full supply vessel of the beverage, comprising:

(a) a plurality of independently and concurrently openable dispensing valves;

(b) a beverage conduit having

(1) a plurality of downstream ends, each of said ends being in fluid communication with a respective said dispensing valve,

(2) first and second upstream ends having thereon means for fluidly connecting the beverage conduit to respective first and second supply vessels having carbonated beverage therein,

(3) a refrigerated reservoir between the downstream ends and the upstream ends for holding refrigerated carbonated beverage under gas pressure and in between the supply vessels and the dispensing valves, and

(4) first and second normally closed beverage supply valves in the first and second upstream ends respectively, each supply valve normally precluding flow of beverage from a respective supply vessel into the reservoir;

(c) a source of compressed gas;

(d) a compressed gas conduit having

(1) an upstream end connected to said source of compressed gas, and

(2) first and second downstream ends, each having thereon means for fluidly connecting the gas conduit to a respective supply vessel;

(e) a sensor responsive to the quantity of beverage within the reservoir, said sensor being structured for maintaining within the reservoir a predetermined quantity of bever-

age, said predetermined quantity being less than the volume of the reservoir;

(f) a circuit operatively connecting the sensor to the first beverage supply valve, so that said sensor effects automatic opening and closing of the first beverage valve for providing intermittent flow of beverage from the first supply vessel as is required for maintaining the predetermined quantity within the reservoir;

(g) means in the beverage conduit between the connecting means and the reservoir for sensing that the first supply vessel has been emptied of beverage; and

(h) means for switching said circuit by disconnecting said sensor from the first beverage supply valve and connecting said sensor to the second beverage supply valve for providing intermittent flow of beverage from the second supply vessel as is further required for maintaining the predetermined quantity within the reservoir after the first supply vessel has been emptied, said switching means being operatively connected to said sensing means for automatic actuation of the switching means by the sensing means.

4,377,247

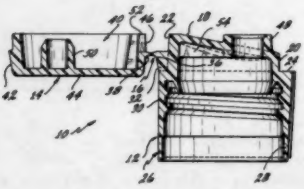
DISPENSING CLOSURE EMPLOYING LIVING HINGE

Robert E. Hazard, Kingstown, and Woodrow S. Wilson, Johnston, both of R.I., assignors to Polytop Corporation, Slatersville, R.I.

Continuation-in-part of Ser. No. 956,435, Oct. 31, 1978, Pat. No. 4,220,248. This application Jul. 23, 1980, Ser. No. 171,386

Int. Cl.³ B65D *25/48*

U.S. Cl. 222—517 **6 Claims**



1. A unitary closure formed of a polymer composition which is capable of being used in a "live" hinge and which is of a self-supporting resilient character, said closure being shaped so as to include a hollow closure part, a lid part and a live hinge means connecting said closure and said lid parts, said closure part including a top and a bottom extending beneath said top around the perhiphery of said top so as to enclose the interior of said closure part, said bottom including means for attaching said closure to a container, said hinge means connecting said closure and said lid parts so that said lid part may be pivoted about an axis of said hinge means into and out of a closed position in which said lid part covers the top of said closure part in which the improvement comprises:

dependent means on said lid part extending downwardly when said lid part is in said closed position,

said hinge means being located so that said dependent means engages a portion of said bottom during movement of said lid into and out of said closed position, said engagement of said dependent means and said portion of said bottom serving to create sufficient temporary deformation within said closure so that said lid will automatically move toward said closed position or toward an open position in which said lid extends generally away from said top of said closure part when it is released after being manipulated to any position between said open and closed positions,

said portion of said bottom is a flat wall,

said hinge means is a single live hinge having a hinge axis, said hinge axis being parallel to said flat wall,

said closure part includes a holder forming a part of said bottom, said holder extending outwardly from said flat wall,

said hinge means being located on said holder so that its axis is spaced from said flat wall and said top and is located above the bottom of said flat wall and below the top of said flat wall,

said lid includes a dependent skirt, said skirt extending around the periphery of said lid between the ends of said hinge means, the portions of said skirt adjacent to the ends of said hinge means serving as said dependent means,

said bottom has the shape of a cylinder interrupted by a chordal plane extending parallel to the axis of said cylinder which is provided with an inwardly directed top shoulder surmounted by a vertically extending wall, said flat wall forming a part of said vertically extending wall, said shoulder also being surmounted by said holder so that said holder appears as an extension of said chordal plane, said vertically extending wall being closed by said top of said closure part.

4,377,248

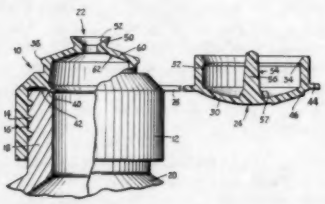
DISPENSING CAP CONSTRUCTION

Morton B. Stull, Split Rock Rd., Boonton Township, Morris County, N.J. 07005

Filed Jan. 9, 1981, Ser. No. 223,542

Int. Cl.³ B67D *3/00*

U.S. Cl. 222—543 **7 Claims**



1. A molded plastic dispensing cap construction for hand-held dispensers, comprising in combination:

(a) a tubular cap body of yieldable plastic substance, comprising a dome-shaped top wall having a pouring spout and an annular outer peripheral portion provided with an annular detent bead located below the pouring spout and at the base of the dome-shaped top wall, and having a top discharge opening at said pouring spout in said top wall,

(b) a cup-shaped captive closure cap of yieldable plastic substance, adapted to be mounted atop said cap body,

(c) a yieldable detent bead in the side wall of the closure cap, cooperable with the annular bead on the top wall of the cap body to yieldably hold the closure cap in mounted position on the body, said beads being adapted to by-pass and be forced past one another when the closure cap is assembled to or removed from the cap body,

(d) a flexible integral hinge structure connecting said cap body and closure cap, for holding the latter captive while enabling it to be swung from a sealing position closing off the discharge opening of the cap body, to a discharge position wherein all parts of the closure cap are removed from and out of contact with the cap body,

(e) cooperable centering means on the closure cap and cap body, rendered operable as the closure cap is swung from the discharge position to the sealing position, for accurately aligning the detent bead of the closure cap with that of the cap body as the cap is being swung to its sealing position, said centering means becoming operative prior to engagement of any parts of the closure cap with any parts of the cap body,

(f) said centering means comprising said pouring spout on the cap body, surrounding said discharge opening and having a sloping inner guide wall of funnel-like configura-

tion, and a depending sealing closure pin on the underside of the closure cap, adapted to be received in the pouring spout and to be guided and centered thereby,

(g) said pin forcing any residual product from the discharge opening back into the dispenser after use of the cap construction,

(h) the length of said pin being sufficiently great to cause positive engagement of the same with the funnel-like guide wall of the spout prior to engagement of any other parts of the cap body and closure cap, thereby to facilitate proper alignment and centering of the closure cap on the body at the time that engagement of said annular detent beads is intended to occur,

(i) said pin having a stiffening fillet where it joins the underside of the closure cap, thereby to strengthen the pin and thus improve the centering function thereof.

4,377,249

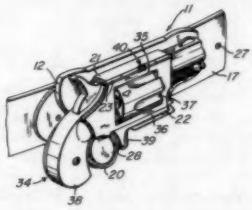
BELT BUCKLE GUN HOLDER

Brian D. Bockoven, Dayton, Ohio, assignor to Michael A. Greenberg, Dayton, Ohio, a part interest

Filed Mar. 23, 1981, Ser. No. 246,283

Int. Cl.³ A45C *11/00*

U.S. Cl. 224—163 **30 Claims**



1. A belt buckle adapted for use as a holder for a gun, comprising means for receiving a gun, said means also retaining said gun on said buckle, some of said means comprising a cover over said gun and being releasable to permit said gun to be withdrawn from said buckle.

4,377,250

METHOD AND A DEVICE FOR CUTTING A PLURALITY OF LIGHT WAVEGUIDES UNITED IN A CABLE

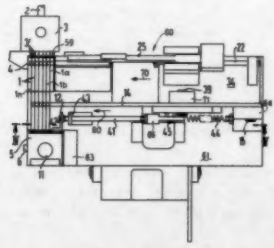
Helmut Muerkl, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 14, 1981, Ser. No. 254,061

Claims priority, application Fed. Rep. of Germany, May 9, 1980, 3017873

Int. Cl.³ C03B *37/16*

U.S. Cl. 225—2 **13 Claims**



1. A method for cutting each light waveguide of a plurality of light waveguides which are assembled in a cable of light waveguides comprising the steps of clamping each of the light waveguides at a first point, clamping each of the light waveguides at a second point spaced from the first point in a common clamp, positioning the light waveguides extending between the first and second points over an anvil with each of the light waveguides being parallel to one another, applying a force to bias the common clamp away from the first point, sequentially lifting each of the light waveguides of the plurality of waveguides so that each lifted light waveguide is prestressed by supporting the entire force to bias the common clamp and while the waveguide is being lifted, notching each prestressed waveguide at a point of contact with the anvil to cause separation of each of the waveguides at its notch.

4,377,251

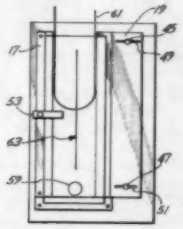
VARIABLE GEOMETRY VACUUM COLUMN

David W. Kincheloe, West Chicago, and David O. Neuthery, St. Charles, both of Ill., assignors to King Instrument Corporation, Westboro, Mass.

Filed Oct. 8, 1980, Ser. No. 195,345

Int. Cl.³ B65H *23/08*; G11B *15/58*

U.S. Cl. 226—195 **11 Claims**



9. For use in a tape cassette loader, a flexible tape tension regulator comprising in combination:

a vacuum column having a back member, a front member, a first side member, a second side member, and a bottom member, wherein (a) all five said members form an encased columnar space having an upper end, a lower end, and an open top for receiving a flexible tape, (b) said second side member is adjustably positionable relative to said first side member so as to allow the cross-sectional area of said columnar space to be varied, and (c) said first side member, said second side member, and said bottom member have plateau portions providing a contact surface for said front member;

first manual securement means for securing said front member against said plateau portions, said securement means being adjustable so as to allow said front member to be removed from said plateau portions;

second manual securement means for securing said second side member to said back member after said second side member has been adjusted to the desired position;

vacuum means for providing communication between a vacuum source and said columnar space, said vacuum means being connected near the lower end of said columnar space; and

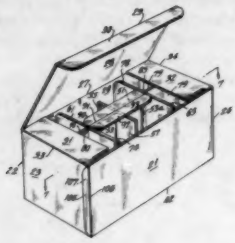
a tape length sensor for monitoring the length of a loop of flexible tape formed in said columnar space.

4,377,252

CONVERTIBLE EIGHT-CELL CARTON

Joseph F. Schillinger, Fulton, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Sep. 8, 1981, Ser. No. 299,976
Int. Cl.³ B65D 5/48, 5/50
U.S. Cl. 229—28 R 8 Claims



1. An erectable, unitary multicell carton comprising a pair of side walls and a pair of end walls connected to form a rectangular carton,

a bottom wall comprising a pair of bottom panels each extending from the lower edge of one of the side walls, each of said bottom panels extending longitudinally of the carton between the end walls to form a single bottom wall which has a juncture line along the longitudinal axis of the carton;

central partition panels extending upwardly from the bottom wall panels at the longitudinal axis of the carton when the carton is erected, said central partition panels extending parallel to the side walls; first additional partition panels extending from the end walls and second additional partition panels extending from the first mentioned central partition panels extending from the bottom walls;

said first additional partition panels extending from the end walls and said second additional partition panels extending from said bottom wall panels cooperating to form partitions parallel to said central partition panels;

said first additional partition panels each having third additional partitions connected normal thereto and extending along said longitudinal axis to form end sections of the central partition of the erected carton;

said end sections aligned with said central partition panels from the bottom wall panels to complete the longitudinal partition;

said central partition panels extending from the bottom wall panels having fourth additional panels foldably connected thereto and positioned centrally of said end walls and at right angles to said central partition panels extending from the bottom wall, wherein said carton when erected forms a carton with a pair of cells at one end of size equal to each other, a pair of cells at the opposite end of a size equal to each other and a pair of central cells on each side of the longitudinal partition between said first mentioned two pairs of cells.

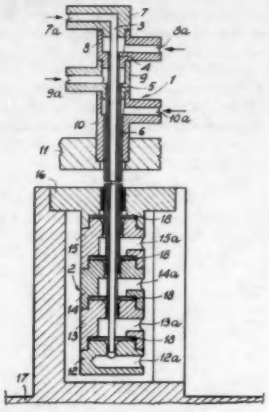
4,377,253

COUPLING ASSEMBLY PARTICULARLY FOR CENTRIFUGES

Robert Bruneel, Overijse, Belgium, assignor to Syglo International S.A., Luxembourg

Filed Jan. 2, 1981, Ser. No. 222,049
Claims priority, application Luxembourg, Feb. 12, 1980, 82161
Int. Cl.³ B04B 11/00
U.S. Cl. 494—38 6 Claims

1. A coupling assembly for a centrifuging device, comprising a fixed part and a rotatable part partially surrounding said fixed part for rotation about an axis of said fixed part, a plurality of conduits in said fixed part each having one end on the exterior of said rotatable part and another end in the interior of said rotatable part, a plurality of conduits in said rotatable part each having one end communicating with a corresponding one of said conduits in said fixed part and another end communicating with the interior of said centrifuging device, wherein said rotatable part comprises a plurality of mutually engaged cup-like elements arranged along said axis coaxially with said fixed



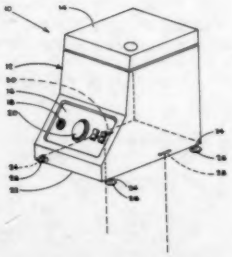
part and in fluid-tight connection with each other and with said fixed part, said cup-like elements each having a lateral portion having a radial passage therein defining at least part of a corresponding one of said conduits in said rotatable part, said cup-like elements defining a chamber around said fixed part communicating with a respective one of said radial passages and said conduits in said fixed part.

4,377,254

CENTRIFUGE HOLDER APPARATUS

Eric C. Huffman, Santa Clara, and James F. Woodall, Mountain View, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jun. 29, 1981, Ser. No. 277,792
Int. Cl.³ B04B 7/02, 15/00
U.S. Cl. 494—12 3 Claims



1. A centrifuge holder assembly comprising:

a centrifuge machine for operating a rotor and having a bottom panel with at least two apertures;

a mounting plate;

means for securely fastening said plate to a horizontal surface on which said centrifuge machine rests; and

means connected to said plate and projecting toward said centrifuge machine for interfacing with said apertures,

said interfacing means designed in such a manner to engage and secure said centrifuge when said centrifuge begins to move horizontally, said interfacing means preventing any significant rotational movement of said centrifuge.

4,377,255

VALVE

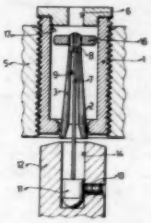
Siegfried Holzbaur, and Gregor Schuster, both of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 12,187, Feb. 14, 1979, abandoned. This application Jul. 11, 1980, Ser. No. 167,582

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1978, 2807466

Int. Cl.³ G05D 23/02

U.S. Cl. 236—93 R 4 Claims



1. A valve having a housing provided with a nozzle element, said nozzle element having a flow-through aperture, a conical nozzle needle having a tip and arranged to project into said flow-through aperture, said flow-through aperture having a larger cross-section than said conical nozzle needle, said valve further having an actuation member, said actuation member having a bore therein to receive a carrier body, said carrier body being attached to an extremity of a flexible elastic steel wire, said steel wire extending into a bore in said conical nozzle needle to said tip thereof, said steel wire allowing said actuation member to actuate said conical nozzle needle asymmetrically wherein said conical nozzle needle includes a circular disc mounted at said conical nozzle tip to control lateral movement of said conical nozzle needle in said guide bore.

4,377,256

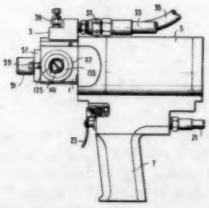
APPARATUS FOR DISPENSING A MIXTURE OF MUTUALLY REACTIVE LIQUIDS

Denis S. Commette, Mantoloking, and John W. Valentine, Bayville, both of N.J., assignors to Gusmer Corporation, Lakewood, N.J.

Filed Jun. 22, 1981, Ser. No. 276,257

Int. Cl.³ B05B 15/02

U.S. Cl. 239—117 19 Claims



1. Apparatus for dispensing a mixture of mutually reactive liquids, comprising a metal housing, a plastic mixing chamber disposed in the housing, the mixing chamber having a bore therethrough, means to deliver mutually reactive liquids along separate paths through said housing and mixing chamber and into said bore to mix in said bore and be dispensed through one end of said bore, and means pressing on the plastic mixing chamber in the direction opposite the direction in which said liquids leave the bore, to compress the plastic mixing chamber in the housing, the metal housing having a surface thereon that contacts the plastic mixing chamber and that faces in the direction in which said liquids leave the bore, said pressing means pressing the plastic mixing chamber against said surface, and said pressing means and said surface contacting said plastic mixing chamber on opposite sides of the points of introduction of said liquids into said bore with respect to the direction in which said liquids leave the bore.

4,377,257

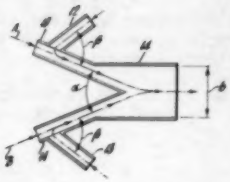
MATERIAL FLUIDIZING APPARATUS

Howard F. Geise, Whitehouse Station, N.J., assignor to Sealed Air Corporation, Saddle Brook, N.J.

Continuation of Ser. No. 37,477, May 9, 1979, abandoned, which is a continuation of Ser. No. 767,354, Feb. 10, 1977, Pat. No. 4,186,256. This application Nov. 12, 1981, Ser. No. 320,321

Int. Cl.³ F23D 11/16

U.S. Cl. 239—419.3 1 Claim



1. Apparatus for fluidizing and intermixing two viscous materials comprising a pair of conduits each having an inlet and an outlet with each conduit carrying one of said viscous materials, a third mixing conduit joined to the outlets of the first said conduits with at least the outlet portions of each of the first said conduits being angularly disposed relative to said third mixing conduit and to the other of said pair of conduits, means for forcing said viscous materials individually under pressure into the inlets of and through each of said pair of conduits, a second pair of conduits each coupled to and communicating with one of the first said pair of conduits and angularly disposed relative thereto for the injection of a compressed gas into the said first pair of conduits and counter to the flow of said viscous materials therethrough, and means for feeding compressed gas to each of said second pair of conduits, whereby said gas will intermix with and fluidize the materials in each of the first said pair of conduits and the fluidized materials will each then enter said third mixing conduit at an angle one relative to the other and to said third mixing conduit and become thoroughly intermixed one with the other in said third mixing conduit.

4,377,258

METHOD AND APPARATUS FOR AGITATING AND INTERMIXING AEROBIC THERMOPHILICAL COMPOSTING ORGANIC WASTE MATERIALS

Carl E. Kipp, Jr., South Charleston, Ohio, assignor to Paygro, Inc., South Charleston, Ohio

Filed Mar. 25, 1981, Ser. No. 247,378

Int. Cl.³ B02C 18/16

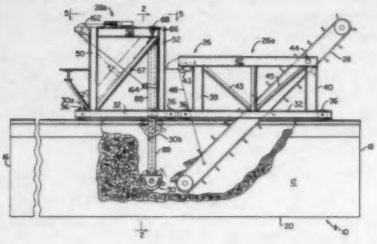
U.S. Cl. 241—27 22 Claims

1. An apparatus for intermixing material, comprising:

(a) an open topped vessel for housing material;

(b) a carriage extending across the top of the vessel from one side to the other, said carriage being longitudinally movable upon the vessel from one end to the other;

(c) a rotary cutting assembly rotatably carried by said carriage, said cutting assembly being vertically movable within the vessel during rotation of said cutting assembly, said cutting assembly serving to agitate and discharge material accumulated in said vessel; and



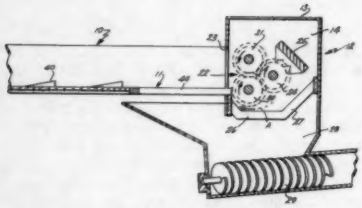
(d) transport means proximately located with respect to said cutting assembly for receiving material discharged therefrom.

4,377,259

CHIP AND TURNINGS SEPARATOR AND CRUSHER

Larry D. Areaux, Kalamazoo, and Russell D. Dudley, Vicksburg, both of Mich., assignors to Reclamet, Inc., Kalamazoo, Mich.

Filed Mar. 21, 1980, Ser. No. 132,519
Int. Cl.³ B02C *4/08*
U.S. Cl. 241—73 **2 Claims**



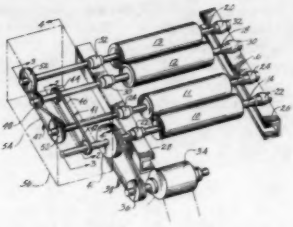
1. In combination with a shredding and tearing crusher a device for separating chunk metal components from the intermeshed turnings and shavings of metal scrap resulting from machining operations whereby the turnings and shavings can be passed through the crusher free of chunk metal, said device having a generally horizontal receiving section, the crusher having bottom and sides; a horizontally elongated scrap receiving port in one of said sides and a plurality of crushing rolls including a pair of vertically spaced receiving and crushing rolls forming a horizontal scrap receiving path between them at said scrap receiving port; means to drive said rolls; the scrap receiving and crushing path between said rolls being so sized as to be suitable only for turnings and shavings; the improvement in said device comprising: said receiving section having a discharge end; a grate member in said receiving section immediately adjacent said scrap receiving port and means spaced from said grate and said rolls for pushing the metal scrap across said grate, said grate member having a plurality of parallel spaced elongated bars extending lengthwise of said receiving section and over which the scrap is pushed; said bars being spaced to retain said intermeshed turnings and to permit small chips and the chunk metal to pass between them the ends of said bars being so positioned with respect to said crushing rolls as to introduce said turnings generally horizontally into said scrap receiving path between the rolls.

4,377,260

ROLLER MILL DRIVE

Jon W. Huffman, 1610 Arboles Dr., Glendale, Calif. 91207

Filed Oct. 24, 1980, Ser. No. 200,318
Int. Cl.³ B02C *4/42*
U.S. Cl. 241—101.2 **40 Claims**



1. In a roller mill having a first pair of rolls and a second pair of rolls, an improved roller mill drive comprising:

an endless chain drive connected with a roll in said first pair and with a roll in said second pair and operative for rotating both rolls in unison; and

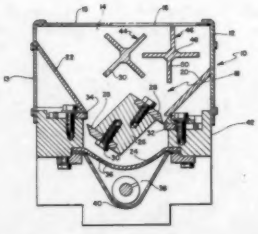
a serpentine chain drive, separate from said endless chain drive, connected with one of the rolls with which said endless chain is connected and also connected with the roll in said first pair and with the roll in said second pair other than the rolls with which said endless chain is connected, the serpentine chain drive being operative for rotating the rolls with which it is connected in unison, the endless chain drive and the serpentine chain drive cooperating to rotate the first pair of rolls in opposite directions and at a speed differential, while also rotating the second pair of rolls in opposite directions and at a speed differential.

4,377,261

GRANULATOR AND IMPROVED FEED MEANS THEREFOR

Thomas J. Dumaine, North Attleboro; Joseph A. Danko, Bellingham, both of Mass., and Donald R. Poland, East Greenwich, R.I., assignors to Leesona Corporation, Warwick, R.I.

Filed Feb. 23, 1981, Ser. No. 236,894
Int. Cl.³ B02C *18/22*
U.S. Cl. 241—222 **8 Claims**



1. In a device for size reduction of material such as plastic scrap from an injection molding machine, said device having a housing in part defining a generally enclosed chamber, an elongated rotor mounted for rotation about an elongated axis within said chamber, cutting means provided on said rotor for cooperative cutting relationship with bed knife means mounted for projection into said chamber as said rotor is driven, elongated feed means positioned above and generally aligned with said rotor and at least partially enclosing said chamber at an

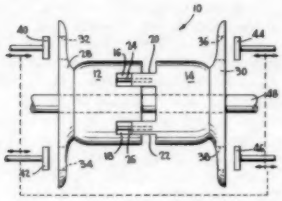
upper end thereof and removable means positioned below said chamber for removing granulated scrap from said granulator, said feed means including a pair of elongated paddle rolls each having spaced blades radially extending from a central shaft, said blades adapted to interdigitate with each other as said shafts rotate in opposite directions towards each other so as to feed material into said chamber, said shafts supported by said housing and normally disposed parallel to each other within a generally laterally disposed plane disposed above said rotor with a first of said shafts fixed in position relative to said housing and the second shaft slidably supported in said housing for movement of any portion of said second shaft towards and away from said first shaft within said lateral plane so as to accomplish increased spacing between said paddle rolls at any location therealong including locations which will skew said second shaft with respect to said first shaft so as to afford the passage of oversized material therebetween, the improvement comprising drive means for driving said shafts in rotational synchronism at all times despite the relative lateral movement which may take place between said shaft, said drive means having a frame pivotally supported on one end of said first shaft, said frame further supporting a pivotal link at one end thereof and to which said shaft is connected at the other end thereof, means extending between said shafts and said frame for transmitting rotary motion to said second shaft as said first shaft is rotated.

4,377,262

TWO-WAY COLLAPSIBLE MANDREL WITH WINDING COMPRESSION

Ronald E. Zajac, Golden's Bridge, N.Y., assignor to Windings, Inc., Golden's Bridge, N.Y.

Filed Mar. 9, 1981, Ser. No. 242,130
Int. Cl.³ B65H *55/02*
U.S. Cl. 242—1 **14 Claims**



1. A method of forming a compressed winding, comprising the steps of:

winding a material on a winding mandrel having an endform at each end thereof in any desired configuration; and

subsequent to completion of the winding, compressing the respective opposite end faces of the winding on said winding mandrel to a substantially straight line configuration by the actuation of oppositely disposed winding compression members engaging said end faces.

4,377,263

RIBBON BREAKING METHOD AND APPARATUS

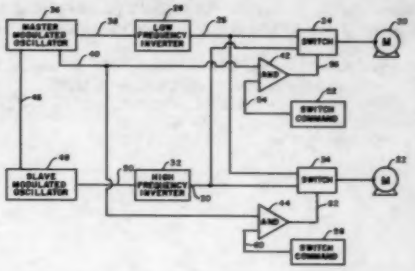
Egidio Guelpa, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

Filed Jun. 18, 1981, Ser. No. 274,842
Int. Cl.³ B65H *54/38*
U.S. Cl. 242—18.1 **6 Claims**

1. A process for controlling a plurality of yarn traversing mechanisms, each of said traversing mechanism controlling the winding of a corresponding yarn package, comprising:

(a) independently connecting each of said traversing mechanisms to a first source of first alternating current having a first mean frequency during winding of a first portion of the corresponding yarn package controlled by each said traversing mechanism; and

(b) independently switching each of said traversing mechanisms to a second source of second alternating current



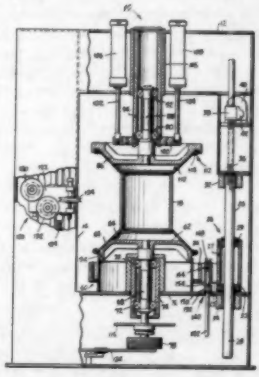
having a mean frequency lower than said first mean frequency during winding of a further portion of the corresponding yarn package controlled by each said traversing mechanism.

4,377,264

SPOOL HANDLING DEVICE

Joseph J. Kovaleski, Easton, and Gordon L. Bauer, Shelton, both of Conn., assignors to Wyrepak Industries, Inc., Bridgeport, Conn.

Filed Jun. 22, 1981, Ser. No. 275,645
Int. Cl.³ B65H *54/12, 67/06*
U.S. Cl. 242—25 R **31 Claims**



1. Equipment for supporting and handling spools of the type having tapered end flanges and adapted to carry wire, comprising in combination:

(a) a housing having an access opening,

(b) carrier means on the housing, having a portion movable between a raised position and a lowered position, for supporting a spool in a generally vertical position, on end at the housing exterior and for enabling shifting of said spool through said access opening to the housing interior, and for lowering the spool from a raised position to a lowered operative position after it has been shifted,

(c) powered means engageable with the spool to rotate the same when said spool is in said lowered position,

(d) a traverse mechanism carried by the housing, having means for guiding a strand of wire onto said spool and for reciprocating said strand along a path substantially paral-

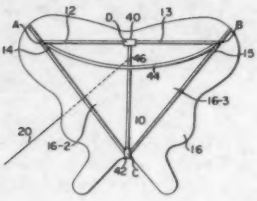
lel to the axis of the spool as the latter is being rotatably driven during filling of the spool with wire.

4,377,265

FLYING OBJECT

Toshiji Takami; Toshio Ito, and Fusako Kawaguchi, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 731,109, Oct. 8, 1976, abandoned. This application Dec. 4, 1980, Ser. No. 213,057
Claims priority, application Japan, Oct. 16, 1975, 50-124806
Int. Cl.³ B64C 31/06
U.S. Cl. 244—153 R 2 Claims



1. A kite, consisting essentially of a wind-bearing surface having a pair of opposite articulate planar sections meeting at a common edge and relatively movable thereabout to change the spacing between said planar surface sections in response to wind bearing against said planar surface sections, said planar surface sections comprising a sheet-like member for bearing wind in flight, and a pair of rigid symmetrical triangular frames, having a common side defining the central axis of the kite, symmetrical about the common side and having said sheet-like member mounted thereon for maintaining said sheet-like member planar while subject to wind pressure in flight; a line attached at a point along said common edge for restraining the kite when it is in flight; and an elastic spacer spanning between said planar surface sections for setting the spacing therebetween, wherein said elastic spacer consists essentially of a single elongate elastic element having a pair of opposite ends each attached to a respective one of said triangular frames and has a spring constant such that the product of said spring constant and a distance from the point of attachment of said line to a point of attachment of said elastic spacer to one of said triangular frames is greater than five times the weight of the kite, and said elastic spacer is shaped embowed away from said triangular frames when it is in an unstressed condition corresponding to no wind pressure being applied to said pair of planar sections.

4,377,266

ELECTRICAL ROTARY JOINT APPARATUS FOR LARGE SPACE STRUCTURES

Robert R. Belew, and Richard J. Boehme, both of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 4, 1981, Ser. No. 231,543
Int. Cl.³ B64G 1/44
U.S. Cl. 244—159 7 Claims

1. A structural array and electrical rotary joint apparatus for use in space structures and the like for transmitting power between large structures having relative rotational movement between each other comprising:

a first large structure having a supportive framework;

a second large structure having a supportive framework;

said first and second large structures being arranged for rotational movement relative to one another coaxially about a common axis of rotation;

a rotary interface defined at a rotary joint between said first and second structures;

a first cylindrical hub member carried centrally by said first structure;

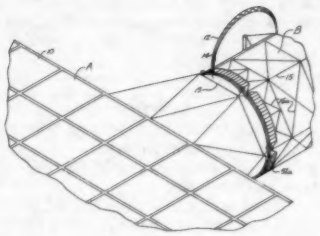
a second cylindrical hub member carried centrally by said second structure;

connecting means connecting said first and second cylindrical hub members with said respective first and second structures in a generally rigid unitary manner whereby said relative rotational movement is transmitted from said first and second structures to said first and second cylindrical members, respectively;

said first and second cylindrical hub members being carried in a concentric relation with respect to one another;

first electrical conductor means carried by said first cylindrical hub member;

second electrical conductor means carried by said second cylindrical hub member, said first and second conductor means being carried in relative sliding contact for transmission of electrical power therebetween during said relative rotational movement;



a bearing support assembly rotatably connected between said first and second cylindrical members for connecting said cylindrical members and respective first and second structures during rotation and accommodating radial and axial loads on and between said cylindrical members;

said bearing assembly including a roller track carried by said first cylindrical member, a radial thrust roller rotatably carried by said second cylindrical member bearing against the outer cylindrical surface of said roller track acting against said radial loads, and a pair of axial thrust rollers rotatably carried by said second cylindrical member engaging sides of said roller track accommodating said axial loads; and

drive means connected between framework of said first and second structures at an outer periphery of said rotary interface joint for rotating one of said structures relative to the other producing said relative rotational movement said drive means including means for interconnecting said first and second structures together as an integral structure as well as rotating said one structure.

4,377,267

VORTEX TRANQUILIZER

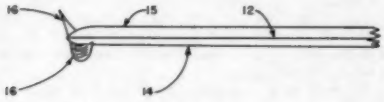
Floy Haworth, Monett, Mo., assignor to Juanita June Haworth, Monett, Mo.

Filed Jan. 12, 1981, Ser. No. 224,166
Int. Cl.³ B64C 3/58
U.S. Cl. 244—199 1 Claim

1. In a heavier than air aircraft having wings, the improvement being a vortex drag reducing device that reduces drag by said device acting as a barrier fore to aft on the wingtips lower surface to discourage lateral or oblique movement of air at said wingtips, and the air retained on the inboard side of said barrier moves rearward along a convex curved inboard surface of said device which produces progressively less dense air rearwardly to provide a path of least resistance rearwardly which influences the airflow to move smoothly from the leading edge to

the trailing edge of the wingtip, where remaining turbulent airflow is led rearward and upward by the portion of said device extending rearward from the trailing edge of the wingtip, said device being:

smoothly and securely attached to the lower surface of the wingtip; positioned fore to aft near the outer end of said wingtip; with a straight outboard surface when viewed from directly below; with a fore to aft mildly convex curved inboard surface when viewed from directly below, said inboard surface joins the lower surface of the wingtip at a right angle; the outboard surface is rounded, smoothed and streamlined and the inboard surface of said device remains vertically flat along its length until said



device extends rearward from the trailing edge of the wingtip, then said extended portion of said device is tapered uniformally; said device is positioned with its most forward point at a location where the wingtip has maximum thickness;

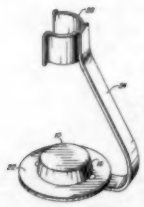
the leading edge of said device angles downward abruptly from the wingtips lower surface until said device has attained full height, with said height being substantially equivalent to the thickness of the wingtip at this point, and said angled leading edge is knife sharp; approximately one third of the total length of said device forms an extension rearward from the trailing edge of the wingtip and said extension of said device curves upward and tapers to a pencil sharp point.

4,377,268

STAND FOR MUSICAL INSTRUMENTS

John W. Wolford, P.O. Box 1024, Dell Lake Village, Dundee, Fla. 33838

Filed Jul. 24, 1980, Ser. No. 171,739
Int. Cl.³ A45D *19/04*
U.S. Cl. 248—176 **7 Claims**



1. A stand for a musical instrument having a bell including a tapered inner surface, an upper end and a lower end, said stand comprising:

a. a round disc having upper and lower surfaces and a side surface gradually tapering inward between the lower and upper surfaces of said disc, the lower surface of said disc having a diameter slightly greater than the diameter of the inner surface of the lower end of the bell for exerting a frictional locking force between the side surface of said disc and the bell to maintain the musical instrument in a fixed position with respect to said disc whereby the upper surface of the disc cannot penetrate into the upper end of the inner surface of the bell;

b. a base coupled to said disc for maintaining the lower surface of said disc in a level position;

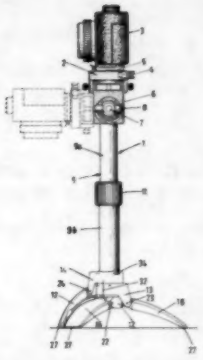
c. a bracket having a first end coupled to said base and a second end positionable around the exterior surface of the bell for stabilizing the musical instrument in a vertical position, said second end of said bracket including a C-shaped element having a diameter approximately equal to the outer diameter of the bell.

4,377,269

STAND FOR OPTICAL DEVICES, PARTICULARLY CAMERAS

Kurt Sellner, Langenzenn, Fed. Rep. of Germany, assignor to Messrs. Cullman Handelsgesellschaft fuer Verbrauchsgueter m.b.H., Langenzenn-Laubendorf, Fed. Rep. of Germany

Filed Jan. 23, 1980, Ser. No. 114,493
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1979, 2902419
Int. Cl.³ F16M *11/38*
U.S. Cl. 248—188.6 **11 Claims**



1. A stand for optical devices, particularly cameras, comprising a securing head for the camera, a spacer articulated thereto and of adjustable length, and at least three legs which are mounted by their inner ends at the lower end of the spacer remote from the securing head by means of supporting elements and each leg being individually pivotable about an axis essentially perpendicular to the spacer axis between an inoperative position, substantially parallel to the spacer axis and an extended operative position, wherein the supporting elements for at least two of the legs are rotatable about the spacer so that the legs can be set to form a table stand at a first operative position in which the legs are substantially equally circumferentially spaced and to form a shoulder stand at a second operative position in which two of the legs are diametrally oppositely disposed and with two of the legs adjacent each other.

4,377,270

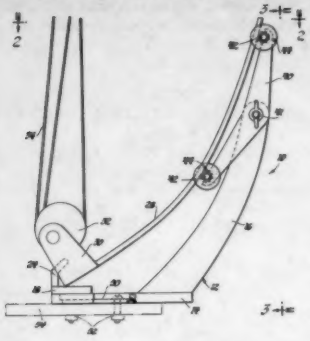
BOW HOLDER

Sidney C. Kolongowski, 9128 Shinanguag, Goodrich, Mich. 48438

Filed Jul. 24, 1980, Ser. No. 171,985
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—441 R **8 Claims**

1. An archery bow holder to maintain a bow in a predetermined rest position comprising primary support means, first auxiliary support means mounted on said primary support means for adjustment relative thereto, and second auxiliary support means mounted on said primary support means for adjustment relative thereto to hold bows of varying sizes in predetermined rest positions, and wherein said primary support means comprises a base member and a support arm extending therefrom, said first auxiliary support means comprising bracket means slidably mounted on said base member for adjustment relative thereto and being operatively engageable

with a portion of a bow to be held, said second auxiliary support means comprising a cradle arm adjustably pivotally con-



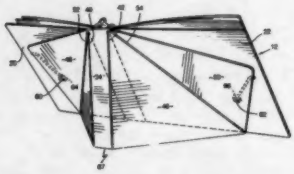
nected to said support arm in spaced relation to said bracket means to operatively support another portion of the bow.

4,377,271

COLLAPSIBLE BINDERS AND THE LIKE

Donald B. Smith, R.R. No. 1, Mount Brydges, Ontario, Canada (N0L 1W0)

Filed May 28, 1980, Ser. No. 154,149
Int. Cl.³ A47B 97/04
U.S. Cl. 248—460 8 Claims



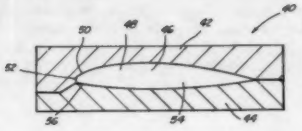
1. In a collapsible support structure the combination with a cover formation including a stiff central panel portion of generally uniform quadrilateral perimetral configuration arranged so as to present upper, lower and side edges and a pair of stiff side panel portions flanking said central panel portion and hingedly connected thereto along opposite side edges for swinging movement from a fully closed position with side panel portion in opposed relation to a substantially fully extended open position in side-by-side coplanar relation with said stiff central panel portion and reversely, of means for supporting said cover formation in inclined relation from below with said aforementioned panel portions disposed in substantially fully extended open position, said supporting means including stiff central strut means having upper lower and side edges hingedly interconnected adjacent its upper edge to said central panel portion to swing from a position thereagainst to a substantially upright position therebelow and shiftable stiff side strut means extending between each side panel portions of said cover and said central strut means and interengageable means presented by said shiftable side strut means and said side panel portions respectively to each other for interengaged relative sliding movement therebetween upon swinging movement from said fully closed position to said fully extended open position and reversely and for releasably anchoring same against displacement when said side panel portions are disposed in substantially coplanar side-by-side inclined relation with said stiff central panel portion.

4,377,272

AIRFOIL STAGNATION POINT MOLD

Thomas A. Waldeck, Wichita, Kans., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 28, 1982, Ser. No. 343,539
Int. Cl.³ B29C 1/00
U.S. Cl. 249—160 4 Claims



1. A two part airfoil mold for forming an airfoil part therein, the mold comprising:

a first half mold, a portion of the first half mold having a cavity therein for forming one half of the airfoil part, the front sides of the mold at one end of the cavity having a continuous contoured shape forming an uninterrupted leading edge of the airfoil part, the rear sides of the mold at the other end of the cavity forming a portion of the trailing edge of the airfoil part; and

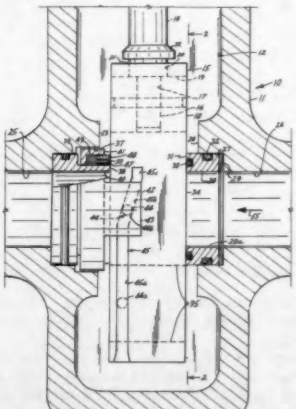
a second half mold, the second half mold indexed with the first half mold with a portion of the second half mold having a cavity therein for forming the other half of the airfoil part, the front sides of the mold at one end of the cavity formed in an area of the typical stagnation point of the airfoil, the rear sides of the mold at one end of the cavity forming the remaining portion of the trailing edge of the airfoil part.

4,377,273

GATE VALVE HAVING A SECONDARY SEAL

John Beson, 10938 Leaning Ash, Houston, Tex. 77079

Filed Feb. 17, 1981, Ser. No. 235,120
Int. Cl.³ F16K 3/34
U.S. Cl. 251—210 8 Claims



1. Gate valve, comprising a valve body having a valve chamber therein, a pair of flow passages through said valve body aligned at opposite sides of said chamber, a gate member within said chamber disposed between said aligned flow passages and being reciprocably movable along a line transverse to said flow passages between a gate position in which said valve is open and a gate position in which said valve is closed, said gate member having a flow passage therethrough which is

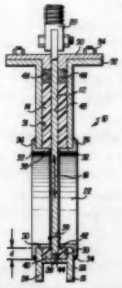
aligned with said aligned flow passages when said gate is in said position in which said valve is open, said gate having an imperforate portion which is aligned with said aligned flow passages when said gate is in said position in which said valve is closed, said valve body having a recess around the inner end of each of said aligned flow passages, a valve seat in each of said recesses, at least one of said valve seats comprising a ring shaped seat against which said gate slides between said open and closed positions, said gate forming a primary metal to metal seal with said seat around a said flow pressure through said valve body when said gate is in said valve closed position, said seat having an annular recess therearound at its end portion adjacent said gate, a seal support ring having an inner recess therearound at its end portion adjacent said gate and being disposed in said recess of said ring shaped seat, a pair of rings disposed in said inner recess of said seal support ring and being spaced radially apart around said recess of said seat, an elastomeric seal ring disposed between said seat and said seal support ring and extending between said rings of said pair of rings toward said gate, and cam means acting between said seal support ring and said gate for drawing said seal support ring toward said gate when said gate is moved from said valve open position toward said valve closed position to force said elastomeric seal ring into sealing engagement with said gate and for moving said seal support ring away from said gate when said gate is moved from said valve closed position toward said valve open position, whereby said elastomeric seal ring forms a secondary seal between said gate and said seat when said valve is closed and is withdrawn from said gate when said valve is opened, said secondary seal being effected after said primary metal to metal seal has been formed and being released before said primary metal to metal seal has been released, whereby said secondary seal when effected is not subjected to high pressure differentials across said gate.

4,377,274

KNIFE GATE VALVE

John D. Mayhew, Jr., 3633 Poplar Drive, SW., Roanoke, Va. 24018

Filed Nov. 10, 1980, Ser. No. 205,492
Int. Cl.³ F16K *3/02*
U.S. Cl. 251—327 **14 Claims**



1. A gate valve comprising:

an elongated, rigid, valve frame having first and second ends, said valve frame comprising two rigid plates and spacing means extending between said two rigid plates for spacing said rigid plates a fixed space one from another, said two rigid plates defining aligned holes extending laterally therethrough for forming a fluid passage through said valve frame, said spacing means being positioned between said plates about said fluid passage, but being spaced from said fluid passage, and not being positioned directly on a first-end side of said fluid passage to thereby leave a free slot from said first end to said fluid passage;

a relatively-resilient valve liner means of a size and shape for selective insertion thereof into said frame, between said rigid plates, from said first end, said relatively-resilient valve liner means comprising two side inserts, with a spacer insert positioned therebetween for defining a slot extending into said liner from said first end, said liner means defining a hole communicating with said slot extending laterally therethrough for forming a fluid passage to coincide with the fluid passage of said frame when said liner means is mounted in said frame, said liner means being seated between said frame plates around the periphery of said fluid passages;

a gate blade for extending into said liner-means slot from said first end for moving into, and out of, a blocking position for fluid passing through said coinciding fluid passages of said frame and said liner means; and

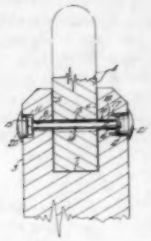
a drive means positioned at said first end linked to said gate blade for moving said gate blade in said slot.

4,377,275

RAILING CONSTRUCTION

Robert V. Faber, 1905 NE. 49th Ave., Portland, Oreg. 97213, and Ronald D. Sylwester, P.O. Box 1404, Lake Grove, Oreg. 97034

Filed Jan. 29, 1981, Ser. No. 229,719
Int. Cl.³ E04H *17/14*; F16B *39/00*
U.S. Cl. 256—69 **1 Claim**



1. Railing construction comprising in combination,

a baluster having a pair of opposed internal vertical wall surfaces and an internal horizontal wall surface extending therebetween defining a recess at its upper end,

a banister positioned within said recess in surfacial abutment with said vertical and horizontal wall surfaces,

said baluster and said banister defining bores in axial alignment with one another when the banister is supported in place within said baluster recess, said baluster also defining a pair of inwardly directed counterbores,

a fastener assembly within said bores and including a head and a nut element one each disposed within a baluster counterbore, said nut element including baluster engaging prongs and permanently in place within the baluster, and

said fastener assembly biasing said baluster vertical wall surfaces into engagement with said banister with loads imparted to the railing banister being transferred directly to the baluster via abutting banister and baluster surfaces whereby shear loading of the fastener assembly is avoided.

4,377,276

SELF-PROPELLING BEVEL FUSION-CUTTING MACHINE

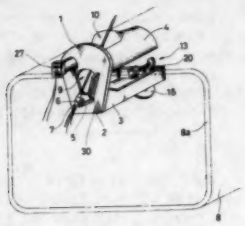
Hiroshi Katsuka, Takarazuka, Japan, assignor to Koei Machine Co., Ltd., Osaka, Japan

Filed Nov. 30, 1981, Ser. No. 326,000
Claims priority, application Japan, Aug. 31, 1981, 56-137208
Int. Cl.³ B23K *7/04*
U.S. Cl. 266—56 **1 Claim**

1. A self-propelling bevel fusion-cutting machine comprising a machine main body which holds a fusion-cutter for effecting

the bevel fusion-cutting of the end face of a pipe, traveling guide rollers which roll on said pipe end face, an outer roller which rolls circumferentially on the outer peripheral surface of the pipe, and an inner roller which rolls circumferentially on the inner peripheral surface of the pipe,

the arrangement being such that the machine main body is movable circumferentially along the pipe end face by means of said rollers, either said outer roller or said inner roller being arranged so that it can be urged against and



moved away from the peripheral surface of the pipe, said roller or the other roller being connected to a drive source mounted on said machine main body so as to be thereby driven for rotation, the axis of rotation of said rotatably driven roller being inclined along the movement direction of said machine main body, with the result that with rotation of said rotatably driven roller, said machine main body is capable of moving circumferentially along said pipe end face while holding said traveling guide rollers in intimate contact with said pipe end face.

4,377,277

BLAST FURNACE HAVING A COOLING DEVICE

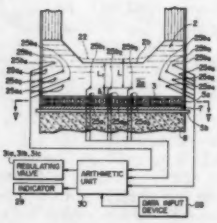
Junzi Misawa; Shinjiro Wakuri, and Kuniyoshi Anan, all of Ohita, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 1, 1980, Ser. No. 174,445

Claims priority, application Japan, Aug. 3, 1979, 54-98644; May 21, 1980, 55-67428

Int. Cl.³ C21B *7/10*

U.S. Cl. 266—80 **13 Claims**



1. A blast furnace comprising:

a foundation;

a hearth bottom including a course of hearth bottom bricks;

a first group of cooling fluid passages horizontally disposed between said course of hearth bottom bricks and said blast furnace foundation for controlling the temperature of the hearth bottom;

a second group of cooling fluid passages horizontally disposed adjacent to or in the blast furnace foundation for directly controlling the temperature of the foundation;

a heat-insulating layer interposed between said first group and said second group of cooling fluid passages permitting said first and second groups of cooling passages to respectively control the temperatures of the hearth bottom and foundation independently; and

a cooling fluid supply device connected to the first and second cooling fluid passage groups, said supply device supplying a cooling fluid to each of said groups of cooling fluid passages so that the cooling capacity of each group can be adjustable independently of the other.

4,377,278

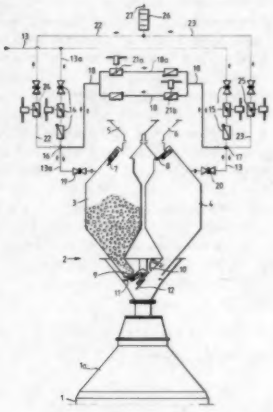
APPARATUS FOR EQUALIZING PRESSURE IN SHAFT FURNACES

Hans Bärmann, Contwig, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed May 4, 1981, Ser. No. 260,208

Int. Cl.³ C21B *7/16, 7/18*

U.S. Cl. 266—197 **8 Claims**



1. An apparatus for use in connection with metallurgical shaft furnaces which operate at pressures in excess of atmospheric pressure, comprising:

(a) a metallurgical blast furnace having a furnace top with a furnace chamber located therebelow;

(b) at least one charge material storage bin connected to and located above said furnace chamber;

(c) said storage bins being sealed from the atmosphere by a charge material inlet seal;

(d) said storage bins being sealed from said furnace chamber by a storage bin exit seal;

(e) a gas supplying conduit connected to said storage bins for selectively supplying pure gas to said storage bins or for exhausting gas from said storage bins into the open atmosphere;

(f) at least one gas chamber vessel;

(g) a gas pressure equalizing means serving to connect said gas chamber vessels to said storage bins; and

(h) said gas pressure equalizing means having a two-way gas direction switching means for selectively equalizing gaseous pressure in said storage bins and said gas chamber vessels.

4,377,279

STEEL WIRE FOUNDATION

Martin Schulz, Jr., Brenham, Tex., and James E. Bane, Carthage, Mo., assignors to Steadley Company, Carthage, Mo.

Filed Jul. 7, 1980, Ser. No. 165,976

Int. Cl.³ F16F *3/02*

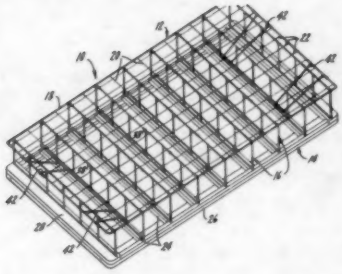
U.S. Cl. 267—103 **22 Claims**

1. In a foundation unit for support of human beings, said

foundation unit being of determined depth and having a flat top bearing structure which is generally rectangular in shape and which has opposite longitudinal end edges and opposite lateral side edges, said foundation unit further having a bottom substructure, and support means intermediate the top bearing structure and bottom substructure for maintaining the determined depth, the improvement comprising a collapsible foundation unit in which

a. said support means comprises a plurality of spaced, parallel rows of support members, each row of support members extending substantially between the opposite lateral side edges of the top bearing structure, and each row of support members lying essentially in a single plane, with a plurality of said rows of support members being located intermediate said end edges,

b. means hingidly securing said rows of support members to said top bearing structure and said bottom substructure to



permit collapse of the foundation unit about said rows of support members, and

c. stabilizing means attached to the foundation unit and positionable in one orientation for maintaining the foundation unit in an expanded state and positionable in a second orientation to permit collapse of the foundation unit, said stabilizing means comprising a plurality of elongated struts extending at an incline between said top bearing member and said bottom substructure when the foundation unit is in the expanded state, at least one of said struts being poised in a direction opposite from at least one other of said struts to prevent collapse of the foundation unit, said struts being rigid in their longitudinal direction and being situated to extend between a said intermediate row of support members and an adjacent row of support members proximate to at least one end edge of said foundation unit.

4,377,280

CYLINDRICAL HELICAL COMPRESSION SPRING

Josef Wienand, and Horst Beihammer, both of Werdohl, Fed. Rep. of Germany, assignors to Stahlwerke Brüninghaus Gesellschaft mit beschränkter Haftung, Werdohl, Fed. Rep. of Germany

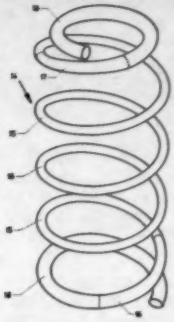
Filed Dec. 27, 1979, Ser. No. 107,577

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1978, 2856632

Int. Cl.³ F16F *1/06*

U.S. Cl. 267—180 **3 Claims**

1. In a cylindrical helically coiled compression spring made of a length of wire or rod having a circular cross section, the spring having interior windings providing the main spring action and end winding portions each of which is arranged to be supported against a spring disc, and the wire or rod having a diameter which varies over the length thereof and is constant over the entire length of the interior windings, the improvement wherein said wire or rod is formed to have a diameter which is greater in the region of both said end winding portions than in the region of said interior windings, and the coil



diameter of at least one said end winding portion is no greater than that of said interior windings.

4,377,281

PIVOTED WEIGHT SUPPORTED FRAME EXERCISE DEVICE

Rudolph W. Jesernig, 2947 E. 10th Ave., Kennewick, Wash. 99336, and Anthony Tenisci, 815 California St., Pullman, Wash. 99163

Filed Feb. 23, 1981, Ser. No. 237,475

Int. Cl.³ A63B *21/06*

U.S. Cl. 272—120 **5 Claims**

1. An exercising device for movably supporting a user adjacent a stationary upright surface of wall, against which the user can engage the feet and thrust rearwardly with the legs to swing the device away from the surface or wall, the exercising device comprising:

a frame having a top end and a bottom end;

means freely suspending the frame from its top end for swinging movement about a stationary transverse horizontal axis;

a user's seat and backrest fixed to the frame adjacent its bottom end and adapted to receive and support a user;

mounting means fixed to the frame below the seat for releasably fixing auxillary weights to the frame to thereby vary the physical force necessary to be exerted by a user positioned on the seat to pivot said frame about said axis.

4,377,282

WRIST ACTIVATOR

Thomas J. Hayes, 11 W. 17th St., New York, N.Y. 10011

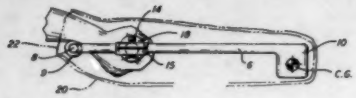
Filed Dec. 11, 1980, Ser. No. 215,498

Int. Cl.³ A63B *23/00*

U.S. Cl. 272—124 **3 Claims**

1. An apparatus for use in exercising the wrist, particularly

for pitching, comprising a rigid elongate frame having a weight at one end, a transverse wrist bar at the other end, a hand grip fastened intermediate the wrist bar and the weight,



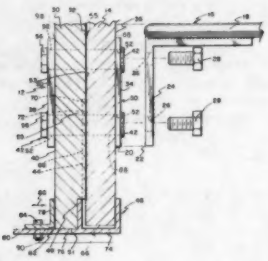
said wrist bar and hand grip defining a plane and the center of gravity of the weight lying outside of the plane, and means for adjusting the spacing between the hand grip and the wrist bar to fit the hand of the user.

4,377,283

BASKETBALL BACKBOARD REINFORCING ASSEMBLY

Kenneth J. Mahoney, Dorrance, Kans. 67634

Filed Mar. 24, 1981, Ser. No. 246,934
Int. Cl.³ A63B *63/08*
U.S. Cl. 273—1.5 R **12 Claims**



1. A basketball goal and backboard assembly having a basketball backboard reinforcing assembly of this invention attached thereto, comprising:

(a) a backboard member;

(b) a basketball goal assembly having an anchor plate adapted to be connected to said backboard member;

(c) a support plate of a size greater than said anchor plate placed against one side of said backboard member to surround said anchor plate;

(d) a connector assembly to clamp said support plate against said backboard member;

(e) connector means to secure said anchor plate to said connector assembly;

(f) a connector plate secured against said support plate by said connector assembly; and

whereby a downward force applied to said basketball goal assembly is transferred through said connector assembly and said connector plate to said support plate to minimize the chances of said backboard member breaking.

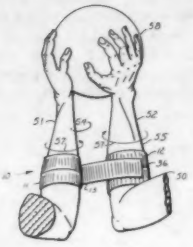
4,377,284

BASKETBALL TRAINING DEVICE

John Okerlin, Rte. 1, Box 15-A-1, Umatilla, Fla. 32784

Filed Jul. 1, 1981, Ser. No. 279,557
Int. Cl.³ A63B *69/00*
U.S. Cl. 273—1.5 A **3 Claims**

3. A training device for a basketball player comprising a pair of sleeves that are circumferentially resiliently stretchable and adapted and arranged to snuggly fit on the forearms of the player, and an elongated narrow flat and longitudinally resiliently stretchable member interconnecting said sleeves for maintaining the players' elbows in close proximity, said member having opposite side faces and opposite ends, said sleeves having respective outer side faces, said member being fastened at one of its opposite ends to one of said sleeves and in an arrangement where one of said opposite side faces of the member facially confront the outer side face of said one of said sleeves, said member being releasably fastened at the other of its opposite ends to the other of said sleeves and in an arrangement where the other of the opposite side faces of the member



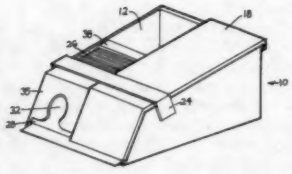
confronts the outer side face of the other of said sleeves, said member being releasably fastened to the other of said sleeves by interconnected hook means and loop means, one of said hook means and loop means being fastened to said member, and the other of said hook means and loop means being fastened to said other of said sleeves.

4,377,285

PLAYING CARD DISPENSER

Thomas P. Kadlic, Absecon, N.J., assignor to Vingt-Et-Un Corporation, Absecon, N.J.

Filed Jul. 21, 1981, Ser. No. 285,478
Int. Cl.³ A63F *1/10*
U.S. Cl. 273—148 A **15 Claims**



7. A playing card dispenser comprising:

(a) at least two compartments each appropriately sized to accomodate a stack of the cards, each compartment having a floor and front, back, and side walls but being open at the top, the floor being angled downwardly toward the front wall;

(b) an opening in the front wall of each compartment from which the cards can be withdrawn one at a time;

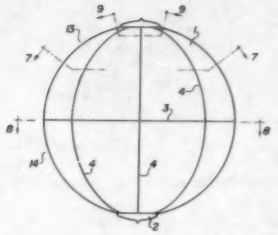
(c) a cover shaped to overlie the front wall and top of all compartments except one from which the cards are to be withdrawn; and

(d) a roller assembly within each compartment, the assembly comprising a roller mounted within a housing moveable within each stack, the roller being rollable on the floor, the housing having a front face angled downwardly toward the front and a rear face angled downwardly toward the rear, whereby cards can be stacked against both faces of the housing.

4,377,286
MULTICOLORED GLOBE ADAPTED TO MAKE COMBINATIONS BETWEEN COLORS ON MULTITUDINOUS DIRECTIONS

Spiridon Constantinescu, 2085 Islington Ave., Apt. 1408, Weston, Ontario, Canada (M9P 3R1)

Continuation-in-part of Ser. No. 302,212, Sep. 14, 1981, abandoned. This application Oct. 26, 1981, Ser. No. 315,344
Int. Cl.³ A63F 9/08; G09B 1/14
U.S. Cl. 273—153 S 9 Claims



1. Apparatus for combining different colors or drawings on a globe made of plastic or metal comprising:

a plurality of first spherical triangles having their sides marked by a plurality of symmetrical meridional lines and by an equatorial line, each said first spherical triangle having a shell bounded by two meridional sides and by an equatorial side, each said meridional side having a first gliding means extending from said equatorial side to a point placed substantially in the vicinity where is room on said shell for four adjacent of said first gliding means, and said equatorial side having a first thickened part;

a plurality of first cylindrical channels for coupling said first spherical triangles between them having the same length as said first gliding means and shaping together with said first gliding means at their end opposite to said equatorial side a truncated cone pointed toward center of said globe, each said first cylindrical channel having two flanges shaping two second gliding means in slidable engagement with said first gliding means, said first gliding means and said second gliding means being hook shaped for preventing the detachment of said first spherical triangles, and said first cylindrical channels having a web which is thin and angled shaping an edge toward inside said globe and being flexible for yielding a variation of distance between said second gliding means;

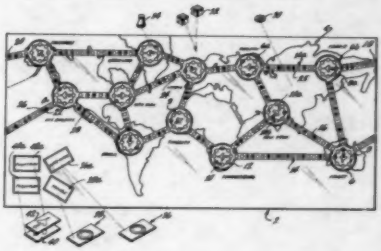
two poles placed to either point where said first spherical triangles converge between them, each said pole being button shaped and having an inside face and an outside face, said inside face having a semicircular dentation placed concentric with said pole, said outside face having a diametrical rib placed parallel with the diameter of said semicircular dentation, and said outside face having also in center a hole for setting said globe into an earth globe frame; and

a rotatable internal framework inside said globe having an axle perpendicularly solid connected to an equatorial disk, said axle having at each end a semicircular spindle matching with said semicircular dentation of said poles and serving for coupling and fixing said poles to said axle by means of a clip, in the vicinity of each end of said axle being perpendicularly placed a partial disk for restraining from rotation half plus 2 of said channels and a first half of said first spherical triangles forming a first hemisphere in comparison with a second half of said first spherical triangles forming a second hemisphere, said partial disk having a periphery shaping a truncated partial cone which matches with said truncated cone, said partial disk having a third gliding means forming a continuity of said second gliding means and for supporting said first gliding means engaged in rotation, said shells being cut toward said poles shaping a hole for allowing the rotation of said first spherical triangles around said spindle, and said equatorial disk having peripherically a spherical section which ensure a correct axial position for said spherical triangles, said spherical section having two circular edges rounded for an easy engagement in meridional rotations of said spherical triangles by means of said first thickened parts, and said spherical section having also on periphery one notch for each said meridional lines for engaging said edges of said cylindrical channels and for ensuring a continuity between said meridional lines at said equatorial line.

4,377,287
BOARD GAME APPARATUS

John R. Erwin, 232 N. Arden Blvd., Los Angeles, Calif. 90004

Filed Dec. 5, 1980, Ser. No. 213,387
Int. Cl.³ A63F 3/04
U.S. Cl. 273—252 6 Claims



1. A board game apparatus for play by two or more players comprising:

a plurality of movable elements, at least one of said elements to be provided each player;

means for each player, when his turn comes up, to develop by chance a numerical factor;

a game board displaying a representation of a map of the world;

a plurality of individually defined zones upon said board and within the parameters of said map, each of said zones containing a central region comprising a pictorial representation of an airplane and a peripheral region comprising a peripheral loop of spaces surrounding said central region, said airplane having a front portion and a back portion such that for a player to complete the movement of said movable element from said peripheral region into said central region, said movable element must enter said central region through said back portion of said airplane and, for a player to complete the movement of said movable element from said central region into said peripheral region, said movable element must exit said central region through said front portion of said airplane;

a plurality of path means extending to and from within said zones constituting a path of travel for said movable elements, the number of path means to be travelled by each element at the turn of its player being determined by the numerical factor developed by said player upon using said means to develop said numerical factor; and, a portion of said path means consisting of a plurality of indicator means;

a plurality of first cards each of which provides information instructing immediate or enabling future forward progress in the movement of said movable element over said path means, one of said cards being selected upon the movement of said movable element onto one of said path means consisting of a corresponding said indicator means said movement having been determined by the numerical factor developed by said player by using said means to develop said numerical factor;

means to develop said numerical factor;

a plurality of second cards, each of which provides information instructing the reversal or the stoppage of the forward movement of said movable element over said path means, one of said cards being selected upon the movement of said movable element onto one of said path means consisting of a corresponding said indicator means, said movement having been determined by the numerical factor developed by said player by using said means to develop said numerical factor;

a plurality of third cards, each of which contains a reference to one of said zones, one of said cards being selected by a player at the start of said game and thereafter whenever said movable element is intended to be moved to one or more of said other zones;

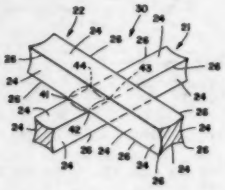
a plurality of game pieces which, when accumulated to a pre-determined number, require said player accumulating said number of said pieces to move said player's movable element immediately to the zone referred to on said player's last selected card of said plurality of third cards.

4,377,288

TENNIS RACKET

Michael S. Sulprizio, 4909 Goni Rd., Carson City, Calif. 89701

Filed Apr. 13, 1981, Ser. No. 253,903
Int. Cl.³ A63B 51/02
U.S. Cl. 273—73 D 9 Claims



1. A tennis racket comprising a frame having a handle and a string grid mounted within said frame, said string comprising a pair of mutually transverse arrays of a plurality of strands, said strands having their ends affixed to said frame with each strand of each array extending across said frame and passing on opposite sides of each adjacent pair of strands in the other array, each strand of each array having a cross-section defining a polygon with a longitudinally extending concave surface on each side thereof, adjacent ones of said longitudinally extending concave side surfaces meeting to define sharp longitudinally extending edges and each junction between strands of said pair of arrays providing compressive contact at four sharply defined spaced points with the surfaces between said points spaced from each other.

4,377,289

FURNACE ELECTRODE SEAL ASSEMBLY

Jean J. Lefebvre, Tracy, Canada, assignor to Qit-Fer et Titane Inc., Quebec, Canada

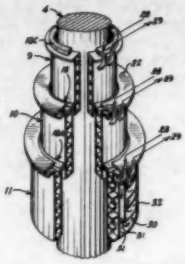
Continuation-in-part of Ser. No. 142,839, Apr. 22, 1980, Pat. No. 4,306,726. This application Dec. 18, 1981, Ser. No. 332,339
Int. Cl.³ F16J 15/06; H05B 7/12
U.S. Cl. 277—12 16 Claims

1. In an electrode furnace of the type in which an electrode extends through an opening in the furnace, an electrode seal assembly to seal the electrode relative to the furnace, said seal assembly comprising:

a plurality of different diameter axially telescopically slidable glands surrounding said electrode, said plurality of glands including a lower gland and and upper gland;

slidable mechanical seal means between said upper gland and said lower gland for sealing between said glands during relative axial movement, said seal means comprising a circumferential seal carried by an outer gland and sealing against an exterior surface of an adjacent inner gland;

means supporting said upper gland for movement with the electrode;



seal means for sealing said upper gland with respect to said electrode; and

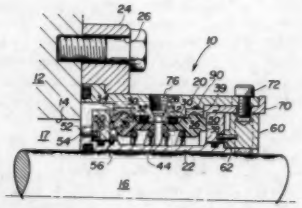
means sealing said lower gland relative to said furnace opening.

4,377,290

SYMMETRICAL SEAL PACKAGE FOR MULTIPLE FACE SEALS

James P. Netzel, Skokie, Ill., assignor to John Crane-Houdaille, Inc., Chicago, Ill.

Filed Mar. 22, 1982, Ser. No. 360,581
Int. Cl.³ F16J 15/34
U.S. Cl. 277—38 5 Claims



1. A symmetrical package seal comprising

a. inner and outer concentric cylindrical members defining a seal package for sealing the space between a rotatable shaft and a housing, said outer member having a flange for affixing said seal package to the housing and said inner member adapted to sealingly engage the shaft;

b. said outer member having an internal surface configuration defining two spaced apart secondary seal seats for receiving two primary seal rings;

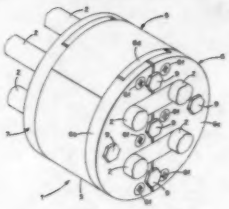
c. said inner member having a backing collar at opposite ends thereof; and

d. balanced radial end face seals positioned within said package in back to back relation to define a fluid chamnber within said package, said seals comprising identical mating rings mounted on said inner member and having a radially extending sealing surface; identical primary seals mounted in driving sealing relation in said outer member and having radial sealing surfaces in sealing engagement with said mating rings.

4,377,291
SEALING ASSEMBLY

Francis G. Albertini, Arlington, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 15, 1982, Ser. No. 368,784
Int. Cl.³ F16J *15/18;* F16L *39/00*
U.S. Cl. 277—105 **20 Claims**



1. A mechanical sealing assembly for establishing a seal between a plurality of elongated members and a hollow enclosure conducting said elongated members, comprising:

a bushing of a resilient, compressible material having a plurality of receiving openings extending therethrough and a plurality of slots extending from and between the perimeter of the bushing and the receiving openings, said slots being arranged to be widened for permitting a plurality of elongated members conducted along the hollow enclosure to be inserted into, and to lie longitudinally within and pass through, the receiving openings, said bushing having a shape generally conforming to the interior configuration of the hollow enclosure;

first and second plates adapted following the insertion of the elongated members into the receiving openings in the bushing to be positioned on opposite sides of the bushing thereby to sandwich the bushing between the plates, each of said plates comprising a plurality of interconnecting sections arranged to surround the elongated members and defining openings corresponding to the receiving openings in the bushing for the receipt therein and passage therethrough of the elongated members, the sandwich assembly of said first and second plates and the bushing having the elongated members passing therethrough being adapted to be inserted into the enclosure; and

compression means operative following insertion of the aforesaid sandwich assembly into the enclosure to compress longitudinally the bushing between the first and second plates by an amount to cause the bushing to expand outwardly at its perimeter thereby to effect a seal therebetween and the enclosure and to cause the bushing to contract around the elongated members thereby to effect seals between the bushing and the elongated members.

4,377,292
CHUCK ASSEMBLY AND COLLET

John C. Staron, Melrose Park, Ill., assignor to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 2,119, Jan. 9, 1979, abandoned. This application Dec. 22, 1980, Ser. No. 219,183
Int. Cl.³ B23B *31/04;* B23C *5/26*
U.S. Cl. 279—46 R **6 Claims**

1. A collet comprising:

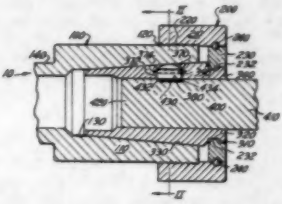
a radially resilient body having a tapered outer surface and a tool-receiving bore extending axially therethrough, said body having an aperture extending radially from the outer surface into said bore;

a tool-securing pin having a head portion at one end thereof, and a tool-securing surface toward the other end thereof; and

means for movably mounting the pin within the collet aperture, said means comprising:

at least one undercut associated with the collet aperture providing a larger opening in the aperture mediate the collet bore and the collet outer surface, said undercut including an arcuate wall defined by a locus of lines parallel to said radial aperture and extending partially toward, but not communicating with, the outer surface of the collet;

an aperture extending through the pin; and

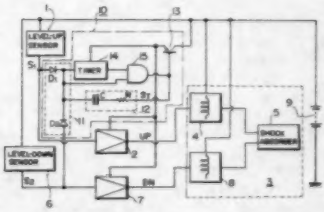


a compressible member for mounting the pin within the collet aperture, said member including telescoping end portions each mounted within the undercut and a medial portion extending through the pin aperture, with the pin aperture being larger than the medial portion of the member to allow limited movement of the pin for locking and releasing the tool within the collet, whereby the member is compressible for mounting the member in the undercut.

4,377,293
LEVEL REGULATOR FOR AN AUTOMOTIVE VEHICLE

Tetsuo Senoo, Inagi, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jan. 9, 1981, Ser. No. 223,842
Claims priority, application Japan, Jan. 16, 1980, 55-3388
Int. Cl.³ B60S *9/00*
U.S. Cl. 280—6 R **4 Claims**



1. A level regulator for an automotive vehicle which comprises:

(a) a pair of level-up and level-down sensors for detecting an abnormal level of the vehicle and for outputting a level-up signal S_1 and a level-down signal S_2 when an abnormal level condition is detected;

(b) a pair of level-up and level-down amplifiers connected to said pair of level-up and level-down sensors, respectively, for amplifying the level-up and level-down signals to generate an UP signal and a DN signal;

(c) a compression and exhaust solenoid valve connected to said level-up amplifier and said level-down amplifier, respectively, said compression solenoid valve being energized in response to the UP signal from said level-up amplifier and said exhaust solenoid valve being energized

in response to the DN signal from said level-down amplifier;

(d) a shock absorber connected to said compression and exhaust solenoid valves for lifting the vehicle when said compression solenoid valve is energized to inject a gas thereinto and for lowering the vehicle when said exhaust solenoid valve is energized to exhaust the gas therefrom;

(e) a power supply for providing voltage to said level-up and level-down sensors and to said level-up and level-down amplifiers; and

(f) means for controlling said power supply voltage for terminating said supply voltage to said level amplifiers after a predetermined period of time in response to either of the level-up signal S_1 or the level-down signal S_2 outputted from said level sensors,

whereby the level regulator is kept activated for a predetermined period of time after either of said level sensors has generated a level signal.

4,377,294

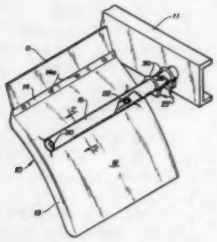
VEHICLE FENDER AND SUPPORT BAR

James R. Lockwood; Kenneth Leffel, both of Wapakoneta, and Joseph A. Ferrante, Maumee, all of Ohio, assignors to Lancaster Colony Corporation, Columbus, Ohio

Filed Mar. 17, 1981, Ser. No. 244,626

Int. Cl.³ B62D *25/16*

U.S. Cl. 280—154.5 R **17 Claims**



1. A fender and support bar therefor for an automotive vehicle wheel set comprising

a rigid panel adapted to be supported adjacent a vehicle wheel set to intercept material thrown peripherally therefrom and being of a width substantially equal to that of the wheel set and of a longitudinal dimension sufficient to cover a predetermined peripheral extent of that wheel set, said panel having a wheel set facing surface and an opposite outwardly facing surface and formed with a transversely extending, elongated channel-form support bar seat disposed intermediate its longitudinally spaced ends, said support bar seat formed in one of said panel surfaces and having a surface of predetermined configuration,

an elongated, tubular support bar positioned in said support bar seat and extending transversely across said panel and projecting a distance laterally from one longitudinal side of said panel for interconnection with and supported mounting on a vehicle chassis, said support bar having a surface conformation complementary to said support bar seat surface, and

connecting means for mechanically interconnecting said panel and said support bar into a rigidly assembled structure, said connecting means including

(1) an elongated inner clamping plate extending axially through the interior of said support bar and disposed in contacting engagement with an interior wall surface of that portion of said support bar which is disposed in said support bar seat, and

(2) a plurality of fastening devices disposed in axially spaced relationship along said clamping plates and operatively coupled therewith to mechanically clamp said plates, panel and support bar into rigidly secured relationship.

4,377,295

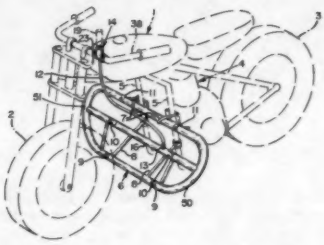
APPARATUS FOR UPRIGHTING A MOTORIZED TWO-WHEELED VEHICLE

Cecil L. Lemman, 225 N. 41, Springfield, Oreg. 97477

Filed Jun. 1, 1981, Ser. No. 269,497

Int. Cl.³ B62H *1/02*

U.S. Cl. 280—303 **6 Claims**



1. Apparatus for uprighting a motorized two-wheel vehicle comprising a vehicle body, front and rear wheels supporting said body, a drive engine supported on said body, a fixably mounted device with means connecting to the frame, a pair of side portions each selectively hingeably connected to the fixably mounted device, an expansible center portion connected between each of said pair of side portions, and means for expanding said center portion.

4,377,296

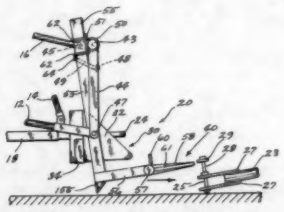
HITCHING APPARATUS

Carl Ulshafer, Jr., 415 Main, Ida Grove, Iowa 51445

Filed Jun. 22, 1981, Ser. No. 275,985

Int. Cl.³ B62D *53/06*

U.S. Cl. 280—425 R **10 Claims**



1. A hitching apparatus for coupling the draft tongue of a trailing vehicle or implement to the drawbar of a draft vehicle having a power lift system, said hitching apparatus comprising:

a projecting pick-up pin attached to the draft tongue;

a latching mechanism attached to the drawbar;

a lifting guide attached to the drawbar, said lifting guide including a stop;

a lifting device including a frame attached to the power lift system of the draft vehicle and a lift bracket pivotally attached to said frame;

said lifting bracket including means for engaging said pick-up pin;

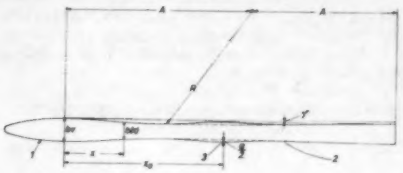
said lifting device being moveable between a lowered position wherein the lifting bracket engages said pick-up pin, and a raised position wherein the lifting bracket contacts said stop of said lifting guide and guides and aligns said draft tongue for coupling with said latching mechanism.

4,377,297

SKI, PARTICULARLY ALPINE SKI

Adolf Staufer, Molln, Austria, assignor to Fisher Gesellschaft m.b.H., Innkreis, Austria

Filed Nov. 26, 1980, Ser. No. 210,669
Claims priority, application Austria, Nov. 29, 1979, 7566/79
Int. Cl.³ A63C 5/04
U.S. Cl. 280—609 7 Claims



1. A ski for snow skiing having a forebody portion, an afterbody portion and an intermediate body portion, said ski comprising:

(a) concave side edges extending along said intermediate body portion to facilitate turning of said skis in snow; and

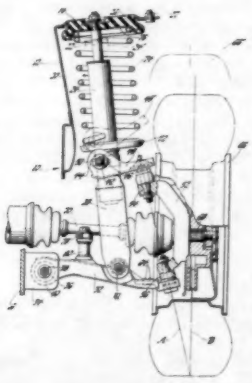
(b) a convex portion superposed adjacent the midpoint of said concave side edges.

4,377,298

VEHICLE WHEEL SUSPENSION

Bernard J. Finn, Troy, and Ming-Chih Yew, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 11, 1981, Ser. No. 272,702
Int. Cl.³ B60G 11/56
U.S. Cl. 280—663 4 Claims



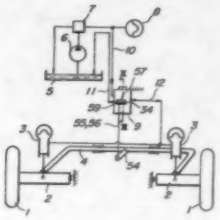
1. Wheel suspension for the sprung mass of a vehicle, comprising, a telescopic hydraulic dampener strut arranged generally upright in the vehicle and connected at its upper end to the sprung mass, a lower control arm extending transversely of the vehicle and swingably mounted at its inner end on the sprung mass, means at a selected location intermediate the ends of the lower control arm connecting the latter end and the lower end of said strut, an upper control arm extending transversely of the vehicle, means swingably mounting the inner end of the upper control arm on the strut intermediate the ends thereof, a wheel support member, pivot means mounting the wheel support member on the upper and lower control arms adjacent the outer ends thereof, and a suspension spring arranged to bear loads transferred between the sprung mass and the wheel support member.

4,377,299

AUTOLEVELING DEVICE FOR A VEHICLE WITH A HYDRO-PNEUMATIC SUSPENSION

Masayuki Fujii, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 15, 1979, Ser. No. 94,573
Claims priority, application Japan, Nov. 20, 1978, 53-142189[U]
Int. Cl.³ B60G 11/26
U.S. Cl. 280—708 6 Claims



1. In a vehicle having a body, wheels, a suspension system affixed to the body and movably supporting the wheels, a hydraulic pressure source, and a hydro-pneumatic suspension unit forming a part of the suspension system for each wheel, an improved autoleveling device for operating the hydro-pneumatic suspension units, the improved autoleveling device comprising: a housing fixed to the vehicle body, said housing including an oil supply port, an oil exhaust port and a cylinder port commonly connected to each said hydro-pneumatic suspension unit, a cam in said housing rotating in response to variations in vehicle body to vehicle wheel relative positions, a first piston in said housing moving in response to the profile of said rotating cam, a second piston in said housing oriented in opposition to said first piston, a first spring interposed between said first and second pistons, a second spring seated on the other side of said second piston to support and balance said second piston in cooperation with said first spring, an oil supply valve in said housing opened by the displacement of said second piston in excess of a selected distance in one direction to communicate said cylinder port with said oil supply port, and an oil exhaust valve in said housing opened by the displacement of said second piston in excess of a selected distance in the other direction to communicate said cylinder port with said oil exhaust port, a first oil chamber in said housing on one side of said second piston enclosing said first spring, and a second oil chamber in said housing on the other side of said second piston enclosing said second spring, said two oil chambers in communication with each other through an orifice.

4,377,300

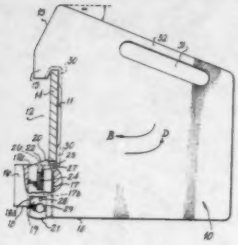
BALLAST WEIGHTS FOR TRACTORS

John L. Old, Kenilworth, England, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Jan. 15, 1981, Ser. No. 225,296
Claims priority, application United Kingdom, Jan. 19, 1980, 8001847
Int. Cl.³ B62D 49/00
U.S. Cl. 280—758 7 Claims

1. A ballast weight having a cut out defined by upper, lower and forward portions, the cut out being capable of receiving at least part of a weight mounting frame having a locating formation on the lower parts thereof, the lower portion of the cut out being arranged to extend beneath the lower part of the weight mounting frame and being provided with a generally vertically extending through cavity, one end of the cavity opening into the cut out and the other end opening through a lower edge of the weight, a latch member mounted for linear sliding movement within the cavity, the latch member being biased so that

one end thereof projects into the cut out from said one end of the cavity to automatically engage said locating formation during installation of ballast weight thus securing the ballast weight in its operational position on the frame, operating means on the other end of the latch member, said operating means projecting from said other end of the cavity to enable



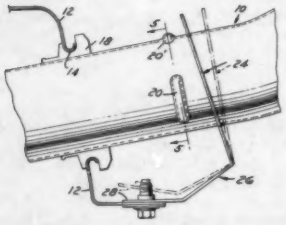
the latch member to be linearly displaced within the cavity against bias to disengage the mounting frame thus enabling removal of the ballast weight, the cross sectional shape of the cavity and the clearance between the latch member and the walls of the cavity ensuring that any extraneous material which enters the cavity is expelled by said linear displacement of the latch member within the cavity.

4,377,301

FUEL TANK FILLER PIPE RETAINER

Gordon L. Craig, Redford Township, Wayne County, and Terry J. Cupp, Ypsilanti, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 6, 1981, Ser. No. 280,183
Int. Cl.³ F16L *3/00*
U.S. Cl. 285—62 **4 Claims**



1. A retainer for the fill pipe of a motor vehicle type fuel tank, the fill pipe having an upstanding bead projecting from its outer diameter, the retainer comprising:

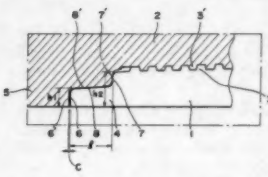
an essentially L-shaped bracket having first and second leg portions extending from each other at an angle other than a right angle, the first leg portion defining a mounting flange adapted to be secured to a portion of a fuel tank, the second leg portion having a keyway opening of a diameter large enough to receive the fuel fill pipe and bead therethrough in an axial sliding manner in one direction during assembly of the fuel pipe to the tank when the bead and opening are axially aligned and when the axis of the second leg portion of the bracket is positioned upright in a first position essentially at right angles to the longitudinal axis of the fill pipe, while impeding return movement of the fill pipe bead in the opposite direction past the bracket when the bracket mounting flange is rotated to axially misalign the bead and opening and fixedly secured to the portion of the fuel tank, the fixedly securing of the flange effecting a pivotal moving of the second leg portion arcuately from the first position at right angles to the pipe longitudinal axis to a second non-right angle position to clamp the edge of the bracket defining the opening against the outer diameter of the pipe and therefore reduce the radius of any portion of the edge from the axis of the pipe to less than the radius of a portion of the bead-like element.

4,377,302

THREADED JOINT WITH HIGH GAS-LEAK-TIGHTNESS FOR OIL AND GAS WELL PIPE

Fuzimasa Kohyama, Kitakyusyushi; Yasusuke Inoue, and Sigeyuki Akase, both of Sagamiharashi, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 11, 1981, Ser. No. 292,027
Claims priority, application Japan, May 14, 1981, 56-71406
Int. Cl.³ F16L *15/00*
U.S. Cl. 285—334 **3 Claims**



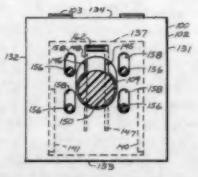
1. A threaded joint with high gas-leak-tightness for oil and gas well pipe comprising: a box having a female thread on its inner face and a pin having a male thread on its outer face, said box and pin being screwed together in use; a non-threaded tip portion of said pin having a front shoulder and a tip shoulder arranged stepwisely, a conical face tapered convergently toward the tip side being formed between said front shoulder and said tip shoulder; a non-threaded portion of said box corresponding to said non-threaded tip portion of said pin having two shoulders corresponding respectively to said front shoulder and said tip shoulder on said non-threaded tip portion of said pin and a conical face between said two shoulders corresponding to said conical face on said non-threaded tip portion of said pin; whereby, when said pin and said box are made up, a first sealing region is formed by metal-to-metal contact of said conical faces and a second sealing region is formed at the final stage of make-up by the abutment between said front shoulder of said pin and said corresponding shoulder of said box and said tip shoulder of said pin and said corresponding shoulder of said box form no substantial sealing region at the time of completion of make-up.

4,377,303

CLOSURE LATCH MECHANISM IMPROVEMENTS

Bruce M. McPherson, 2342 Sunderland Rd., Maitland, Fla. 32751

Filed Aug. 4, 1980, Ser. No. 174,880
Int. Cl.³ E05C *1/10*
U.S. Cl. 292—152 **11 Claims**



1. In a portable container having a hollow body component with an opening to the exterior thereof, a closure component closing the opening of the body component, and a latching

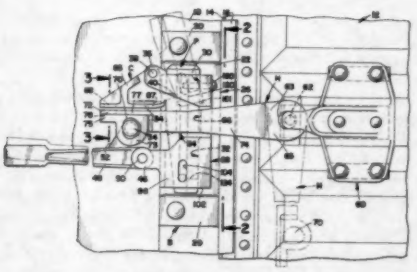
mechanism latching the closure component to the body component, the improvement wherein said closure component has a wall with an exterior side face, said mechanism comprises a latch carrying slide component with a planar body portion that has opposite side faces and is located inwardly of said exterior side face, means mounting the slide component for linear sliding movement on the wall of said closure component between latched and unlatched positions therefor, and a device releasably locking the slide component at its latched position, said device including an elongated, flat, resiliently deflectable member which has proximal and distal ends and is joined at its proximal end to the planar body portion as an integral part thereof, a detent which is located inwardly of said exterior side face and is fixed to and movable with the deflectable member at one of said opposite side faces, and means which is located laterally of said one side face and has a recess that is arranged to receive the detent when the slide component is at its latched position, thereby to lock the slide component at said latched position, said deflectable member having a normal position at which the member is unstressed and located in the plane of the body portion and also having a bent position at which the member is stressed and the distal end is located laterally inwardly of the plane of the body portion and of the exterior side face of said wall, said member being arranged to assume its normal position as the detent is received in said recess, and said member being arranged for depression and movement into its bent position from its normal position by finger pressure exerted at said exterior side face, and thereby to move the detent out of said recess and release the slide component for movement from its latched position.

4,377,304

DOOR LOCK

Charles W. Mayfield, and Oliver J. Jenkins, both of Youngstown, Ohio, assignors to Youngstown Steel Door Company, Cleveland, Ohio

Filed Oct. 6, 1980, Ser. No. 193,903
Int. Cl.³ E05C *13/02, 19/08*
U.S. Cl. 292—283 **7 Claims**



1. In a door lock of the type including a bracket having vertically-spaced upper and lower sleeves with substantially vertically aligned upper and lower pin receiving openings therethrough, a movable hasp having a hasp sleeve portion with a hasp opening therethrough, said hasp being movable to a securing position in which said sleeve portion thereof is located between said upper and lower sleeves with said hasp opening substantially vertically aligned with said upper and lower openings, a lever pivotally mounted on said bracket, cooperating means between said lever and hasp for moving said hasp in response to swinging movement of said lever to align said hasp opening with said upper and lower openings and to effect initial opening or final closing movement of a door to which said hasp is connected, said lower sleeve having an outer wall with a bottom edge, a pin receivable in said openings to define a pin locking position for securing said hasp against movement, said pin having a bottom end, a hole through said pin adjacent said bottom end thereof, said pin in said locking position having said hole therein located adjacent said bottom edge of said lower sleeve outer wall for receiving a security member to inhibit upward movement of said pin through said lower opening, a cam member pivotally mounted on said bracket adjacent said upper sleeve for movement between pin blocking and pin releasing positions, said cam member in said pin blocking position cooperating with said pin for preventing upward movement of said pin out of said hasp opening and in said pin releasing position providing free upward movement of said pin out of said hasp opening, said cam member having a lower flange and said hasp having an upper wall portion aligned with said flange, and said lower flange and said hasp upper wall portion having substantially vertical holes therethrough for receiving a security member to lock said cam member in said pin blocking position, the improvement comprising: said sleeves and said holes in said cam member lower flange and hasp upper wall portion being positioned on opposite sides of said cooperating means between said lever and hasp.

4. In a door lock of the type including a bracket having vertically-spaced upper and lower sleeves with substantially vertically aligned upper and lower pin receiving openings therethrough, a movable hasp having a hasp sleeve portion with a hasp opening therethrough, said hasp being movable to a securing position in which said sleeve portion thereof is located between said upper and lower sleeves with said hasp opening substantially vertically aligned with said upper and lower openings, a lever pivotally mounted on said bracket, cooperating means between said lever and hasp for moving said hasp in response to swinging movement of said lever to align said hasp opening with said upper and lower openings and to effect initial opening or final closing movement of a door to which said hasp is connected, said lower sleeve having an outer wall with a bottom edge, a pin receivable in said openings to define a pin locking position for securing said hasp against movement, said pin having a bottom end, a hole through said pin adjacent said bottom end thereof, said pin in said locking position having said hole therein located adjacent said bottom edge of said lower sleeve outer wall for receiving a security member to inhibit upward movement of said pin through said lower opening, the improvement comprising: said pin in said locking position thereof having said hole therein spaced above said bottom edge of said lower sleeve outer wall and said lower sleeve outer wall having a hole therein aligned with said hole in said pin, at least one of said holes in said pin and outer wall being a generally vertically elongated slot, a cam member pivotally mounted on said bracket adjacent said upper sleeve for movement between pin blocking and pin releasing positions, said cam member in said pin blocking position cooperating with said pin for preventing upward movement of said pin out of said hasp opening and said cam member in said pin releasing position providing free upward movement of said pin out of said hasp opening, said cam member having a lower flange and said hasp having an upper generally horizontal hasp wall positioned closely below said cam member flange when said hasp is in said securing position, said cam member flange and said hasp wall having substantially vertical holes therethrough which are aligned in said pin blocking position of said cam member and said securing position of said hasp for receiving a security member, and said cooperating means between said lever and hasp being located intermediate said sleeves and said holes in said cam member flange and hasp wall.

7. The improvement as defined in claim **1** wherein said slot is in said outer wall of said lower sleeve and said hole in said pin is substantially circular and has a diameter which is substantially the same as the width of said slot.

4,377,305

ARTIFICIAL HAND

Eduard Horvath, Vienna, Austria, assignor to Otto Bock Orthopädische Industrie KG, Duderstadt, Fed. Rep. of Germany

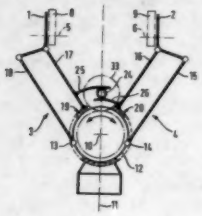
PCT No. PCT/AT80/00015, § 371 Date Jan. 21, 1981, § 102(e) Date Jan. 21, 1981, PCT Pub. No. WO80/02500, PCT Pub. Date Nov. 27, 1980

PCT Filed May 20, 1980, Ser. No. 226,613

Claims priority, application Austria, May 21, 1979, 3735/79

Int. Cl.[3] A61F *1/06*; B25J *15/00*

U.S. Cl. 294—106 8 Claims



1. An artificial hand comprising:

a support rotatable about a first axis;

a ring mounted on said support for rotation about a second axis constituting the axis of said ring and perpendicular to said first axis;

a pair of hinge quadrangles each having a first limb pivotally connecting the said ring for rotation therewith, a second limb generally parallel to said first limb and having an end displaceable along said ring whereby extensions of said second limbs intersect at said second axis whereby said quadrangles virtually have a common pivot axis coinciding with said second axis, and a third limb articulated to said first and second limbs;

respective clamping jaws pivotally mounted on the respective hinge quadrangles and tiltable relative thereto about a respective third axis generally transverse to a plane common to said first and second axes, said jaws being juxtaposed for engagement of objects therebetween and being displaced toward and away from one another by swinging movement of said second limbs toward and away from one another; and

means for angularly displacing at least one of said jaws about the respective third axis relative to the respective hinge quadrangle and for relatively displacing said second limbs of said hinge quadrangles.

4,377,306

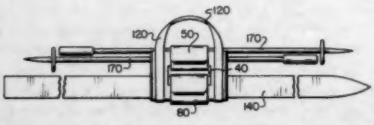
SKI AND SKI POLE TOTE

Diana P. Abatecola, 741 Carlow Ct., El Cajon, Calif. 92020

Filed Aug. 24, 1981, Ser. No. 295,851

Int. Cl.[3] A63C *11/02*

U.S. Cl. 294—147 9 Claims



1. A ski and ski pole tote comprising:

a wrap sheet of strong, flexible material having a pair of spaced apart openings therein;

a first flap on said wrap sheet adapted to extend through the openings in said wrap sheet when said wrap sheet is folded to a substantially U-shaped configuration with said openings aligned for forming a pocket for seating said skis;

first fastening means on said first flap to fasten it to said wrap sheet when skis are placed within said pocket;

a second flap on said wrap sheet near one end thereof and adapted to extend through said openings when said wrap sheet is folded, and second flap forming a pocket for seating the ski poles;

second fastening means on said second flap to fasten it to said wrap sheet when ski poles are placed within said pocket; and

hand carrying means on the ends of said wrap sheet which form a hand grip when said wrap sheet is folded.

4,377,307

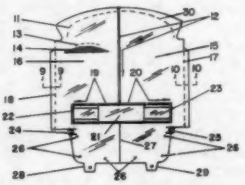
SELF SECURING TONNEAU COVER

Francis L. Santarelli, 58 St. James. Ct., Daly City, Calif. 94015

Filed Nov. 17, 1980, Ser. No. 207,457

Int. Cl.[3] B60J *7/20*

U.S. Cl. 296—136 7 Claims



1. In combination with a vehicle having a passenger compartment defined at its front by a transversely extending section commonly known as the dashboard, at its sides by a pair of vehicle side walls, at its rear by a transversely extending panel, and having an open upper side and a tonneau cover, each of said vehicle side walls includes a door having a window well, and said tonneau cover comprises:

a main body portion of a substantially rigid material;

attachment means extending downward from said main body portion, and a plurality of tabular members extending into said window wells of said doors of said vehicle, said attachment means extends from said main body portion for a sufficient extent to hold said cover to said vehicle, said attachment means are substantially rigid, whereby said vehicle can remain as originally manufactured, while said cover is able to extend over, protect, and decorate said passenger compartment of said vehicle.

4,377,308

ASYMMETRICAL ANATOMIC ARM-CHAIR, PARTICULARLY FOR ODONTOLOGICAL USE

Antonio Pisanu, C.so Vittorio Emanuele, 108, 07010 Ittiri (Sassari), Italy

Filed Feb. 23, 1981, Ser. No. 236,880

Claims priority, application Italy, Feb. 29, 1980, 20274 A/80

Int. Cl.[3] A47C *1/032, 7/02*

U.S. Cl. 297—353 12 Claims

1. An anatomic arm-chair comprising a seat, a back articulated with respect to the seat and a headrest articulated to the back, wherein said seat is substantially rigid and has an asym-

metrical anatomically contoured surface for supporting a patient with one side at lowered position relative to the other

side, and the trunk slightly rotated and turned towards the lowered side.

4,377,309

SUPPORTING DEVICE FOR USE IN A KNEELING-LIKE SITTING POSTURE

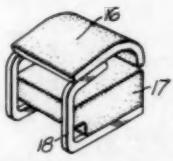
Hans C. Mengsboel, Bygdoey alle 12, Oslo 12, Norway

Filed Jun. 15, 1979, Ser. No. 48,785

Claims priority, application Norway, Jun. 19, 1978, 782144; Jun. 6, 1979, 791892

Int. Cl.³ A47C 7/50

U.S. Cl. 297—423 **16 Claims**



1. A device for supporting a human subject in a kneeling position comprising means adapted for simultaneously providing support for the ankle of each leg of the subject and for the subject's posterior, said support means including:

a first member having a bottom portion which is adapted for engaging and resting on a base surface and an upper portion adapted to engage the ankle of each leg of the subject to provide support for each ankle with respect to said base surface, and

a second member separate from said first member and having a seat portion adapted for engaging and supporting the posterior of the subject while kneeling, said second member being formed with a storage section below its storage portions, said first member being storable in said storage section.

4,377,310

METHOD OF UNDERGROUND WORKING OF ORE DEPOSITS AND HANDLING ORE

Ivan P. Gubin, ulitsa Sechenova, 23, kv. 44; Sergei G. Machavariani, ulitsa M. Toreza, 113, kv. 8, both of Novokuznetsk Kemerovskoi oblasti; Nikolai S. Efremovtsev, Nakhimovsky prospekt, 25/1, kv. 51, Moscow; Viktor A. Kovalenko, prospekt Metallurgov, 25, kv. 128; Alexandr V. Mozolev, prospekt Suvorova, 5, kv. 6, both of Novokuznetsk Kemerovskoi oblasti; Sergei I. Nikolaev, ulitsa Lenina, 3, kv. 20, Nizhny Tagil Sverdlovskoi oblasti; Georgy I. Nikolaev, prospekt Stroitelei, 2, kv. 12, Kushva Sverdlovskoi oblasti; Viktor A. Guriyanov, ulitsa M. Toreza, 86 "A", kv. 22, Novokuznetsk Kemerovskoi oblasti; Anatoly I. Temnikov, ulitsa Astrakhanskaya, 4, kv. 3, Perm; Evgeny E. Tyryshkin, 13 mikroraion, 12, kv. 101, Novokuznetsk Kemerovskoi oblasti; Nikolai G. Dubynin, ulitsa Krasnaya, 5, kv. 78, Kemerovo; Volf Z. Kogan, ulitsa Astrakhanskaya, 4, kv. 6, Perm; Anatoly P. Ljubkin, ulitsa Kirova, 75, kv. 115, and Anatoly P. Sedko, ulitsa Bardina, 5, kv. 10, both of Novokuznetsk Kemerovskoi oblasti, all of U.S.S.R.

Filed May 6, 1980, Ser. No. 147,199

Int. Cl.³ E21C 41/06

U.S. Cl. 299—13 **1 Claim**

1. A method for underground working of ore deposits, comprising the steps of driving galleries; blasting; conducting release and loading of ore to haulage vehicles; during said release of ore, dividing ore flow in the zone of an outlet opening into at least two parts by a vertical plane and swinging said ore flow transversely to the direction of ore flow by alternately changing the density of ore in parts of the ore flow; transferring oversized lumps of ore released to a loading drift along a ramp, by-passing said haulage vehicles, to ventilating and man roads arranged at the level of floor of haulage crosscuts and connected thereto at points opposite to the loading drifts.

4,377,311

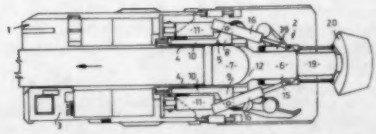
MULTI-PURPOSE MINING MACHINE

Barry Seller, Sydney, Australia, assignor to Fox Manufacturing Company Pty. Limited, Australia

Filed Feb. 4, 1981, Ser. No. 231,457

Int. Cl.³ E21C 27/24

U.S. Cl. 299—75 **9 Claims**



1. A mining machine adapted to be propelled by a power unit, comprising a boom including a first part and a second part, a pivotal coupling between the power unit and said first part, the axis of said pivotal connection being generally horizontal, a pivotal coupling between said first and second parts, the axis of said latter coupling being substantially at right angles to the axis of the former pivotal coupling, said second part comprising an elongated and generally hollow first section

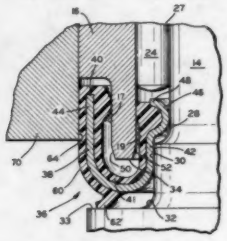
and an elongated second section slideably housed in said first section, said second section including gear means, cutter means, and means for coupling said cutter means to said gear means, driving means disposed in said first section and adapted to be demountably coupled to said gear means, and means for adjusting the length of said boom by sliding said second section within said first section, said adjusting means being releasably coupled to said second section whereby said second section with said gear means, said cutter means, and said means for coupling said cutter means to said gear means may be removed from said machine and another second section may be substituted therefor.

4,377,312

BEARING SEAL

Barry L. Zackrisson, Toledo, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed Mar. 6, 1981, Ser. No. 241,320
Int. Cl.³ F16C *33/78*; F16D *3/26*
U.S. Cl. 308—187.1 **5 Claims**



1. In a bearing race seal disposed for use in the interface of trunnion and journal yoke members of a universal joint, said seal including an annular metallic backbone having a generally U-shaped cross section, said backbone disposed for engagement of said seal with inner and outer peripheries of a bearing race, said seal further including an elastomeric coating member bonded to portions of said backbone; an improvement comprising an external sealing lip integral with said elastomeric coating member and disposed for engagement with a trunnion, said improvement further comprising an external wall portion integral with said elastomeric coating member and disposed for engagement with a journal yoke member to define a labyrinth seal including at least one sealing engagement between each of:
(a) said backbone and said yoke member,
(b) said backbone and said outer periphery of said race,
(c) said backbone and said inner periphery of said race, and
(d) said backbone and said trunnion.

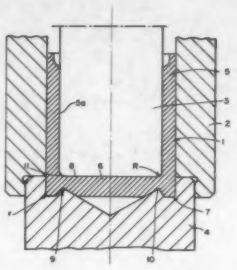
4,377,313

THIN-WALLED BEARING BUSHINGS PRODUCED IN THE DRAWING PROCESS

Armin Olschewski, Schweinfurt; Hermann Hetterich, Heidenfeld, and Peter Horling, Mainberg, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Dec. 22, 1980, Ser. No. 218,520
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2952092
Int. Cl.³ F16D *3/24*
U.S. Cl. 308—216 **4 Claims**

1. Thin-walled bearing bushing produced in a drawing process for the support of pins in universal joints, consisting of a cylindrical sleeve section and a bottom section of nominal thickness which closes this cylindrical sleeve section on one axial end whereby a peripheral rim with a small cross sectional radius is formed between the outside surface of the sleeve section and the outside surface of the bottom section, and means defining a circumferentially extending groove in the one surface of the bottom section disposed radially inward of the peripheral rim adjacent the juncture of the sleeve and bottom, said groove being deep with respect to the nominal thickness of said bottom and having a sharp profile and axially impressed during drawing in said one surface as to reduce the wall thickness of the bottom section and to displace construction material outward into the area of the peripheral rim between the bottom section and the sleeve section of the bearing bushing, the material in the area of the peripheral rim being uniformly compressed.

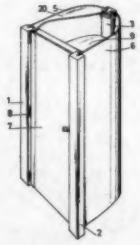


4,377,314

PIECE OF FURNITURE PARTICULARLY FOR STOWING GOODS AWAY, AND STOW-AWAY UNIT FORMED BY SUCH PIECES OF FURNITURE

Christophe Gevers, Chemin du Fond Coron, 27, Ohain, Belgium

Filed Oct. 14, 1980, Ser. No. 196,851
Claims priority, application Belgium, Oct. 17, 1979, 0/197682
Int. Cl.³ E06B *9/14*; E04B *1/32*
U.S. Cl. 312—297 **18 Claims**

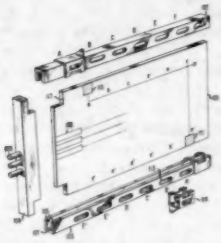


1. An article of furniture comprising, a pair of uprights having upper and lower ends, cross members connecting said pair of uprights in laterally spaced apart relationship, said uprights and cross members providing a vertical unsupported frame for said article of furniture, resilient sheet material wall means having upper and lower edges and opposite side edge means between said upper and lower edges, said sheet material wall means being bent to an arcuate curvature between said side edge means and against the resilient bias of said sheet material, means interconnecting each of said opposite side edge means with a different one of said pair of uprights between said upper and lower ends of said uprights, whereby said uprights and cross members alone maintain said sheet material wall means bent against said resilient bias thereof and said sheet material wall means maintains said frame vertical, at least one horizontal shelf, and bearing means supporting said shelf relative to said uprights and said bent sheet material wall means.

4,377,315
CIRCUIT BOARD KEYING ARRANGEMENT

Thomas G. Grau, Mendham Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 9, 1981, Ser. No. 232,424
Int. Cl.³ H01R 13/64
U.S. Cl. 339—17 R 13 Claims



1. For use with circuit boards that plug into matching receptacles, an arrangement for indicating the insertion of a board into any but a matching receptacle characterized by

a plurality of contact pairs each having a first contact adapted for engagement with a second contact,

said first contact and said second contact of each pair respectively located on said circuit board and said receptacle in selectable locations along individual rows colinear with the direction of insertion, and

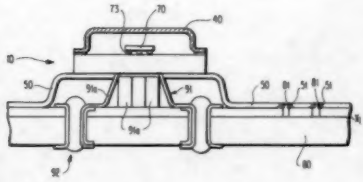
means for indicating when the contacts of a said pair are engaged,

wherein said contacts are mounted at row locations selected so that at least the contacts of one of said pairs are engaged before a mismatched circuit board is fully inserted in said receptacle.

4,377,316
HIGH DENSITY INTERCONNECTION MEANS FOR CHIP CARRIERS

Mario E. Ecker, Poughkeepsie, N.Y., and Leonard T. Olson, Jericho, Vt., assignors to International Business Machines Corporation, Hopewell Junction, N.Y.

Filed Feb. 27, 1981, Ser. No. 238,873
Int. Cl.³ H05K 1/18
U.S. Cl. 339—17 CF 7 Claims



1. A connecting system for semiconductor devices which comprises:

a semiconductor carried on one major surface of a substrate, said semiconductor being in selective electric contact through said substrate with an opposed major surface of said substrate;

a flexible, extendable, synthetic resinous membrane attached to the opposed major surface of said substrate, said membrane carrying internally a conductive metal pattern which is in selective electrical contact with said semiconductor through said substrate, said membrane having an area greater than said substrate and, in the area thereof exterior the periphery of said substrate, being provided with electrical contacts in electrical communication with said conductive metal pattern;

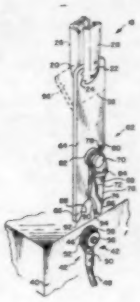
a printed circuit card in electric contact with said semiconductor by way of electrical contacts in said printed circuit card which complement the electrical contacts in the periphery of said membrane and are in electric contact therewith; and

biasing means between said substrate and said printed circuit card, said biasing means maintaining said semiconductor and said printed circuit card in thermal and electrical contact and separating said substrate and said printed circuit card.

4,377,317
ADAPTER FOR CONNECTING AUXILIARY CABLE TO SIDE TERMINAL BATTERY

Joseph Shekel, New York, and Joseph DeStefano, Carle Place, both of N.Y., assignors to Auto-Line Manufacturing Corp., Copaigue, N.Y.

Filed Jun. 27, 1980, Ser. No. 161,398
Int. Cl.³ H01R 11/00
U.S. Cl. 339—29 B 7 Claims



1 An adapter for connecting an auxiliary cable to a side terminal of a side terminal battery, said side terminal having a head portion with a circumferential groove therein, said adapter comprising:

a metallic member comprising two separate clamp halves;

a first clamp half;

a first inner contour on said first clamp half having a shape and thickness adapted for fitting within a first portion of said circumferential groove at a first side of said side terminal;

a second clamp half disposed opposed to said first clamp half;

a second inner contour on said second clamp half opposed to said first inner contour and having a shape and thickness adapted for fitting within a second portion of said circumferential groove at a second side of said side terminal which is substantially opposite said first side;

means for pivoting said second clamp half to permit motion of said second inner contour toward and away from said first inner contour;

resilient means for urging said second clamp half about said means for pivoting toward said first clamp half;

at least one camming surface on an outer end of at least said second clamp half, said camming surface being adapted for contacting said circumferential groove and for pivoting said second inner contour away from said first inner contour when said camming surface is pressed onto said circumferential groove whereby said first and second inner contours are opened to a dimension sufficient for entry of said circumferential groove therebetween;

said resilient means being effective to clamp said first and second inner contours in said circumferential groove about said side terminal whereby mechanical and electrical con-

nection between said adapter and said side terminal is achieved; and

means for mechanically and electrically connecting said auxiliary cable to said adapter whereby mechanical and electrical connection between said side terminal and said auxiliary cable is achieved through said adapter.

4,377,318

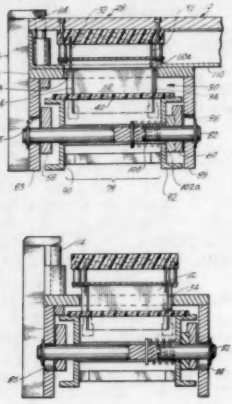
LOW INSERTION FORCE ELECTRICAL INTERFACE ASSEMBLY AND ACTUABLE INTERFACE ASSEMBLY THEREFOR

Everett J. Long, Claremont, Calif., assignor to Everett/Charles, Inc., Pomona, Calif.

Continuation of Ser. No. 875,231, Feb. 6, 1978, abandoned. This application May 9, 1980, Ser. No. 148,537

Int. Cl.³ H01R *13/54*

U.S. Cl. 339—75 M **28 Claims**



1. A low insertion force electrical interconnect system comprising:

support means;

connector means adapted in cooperation with the support means for mounting on and removal from the support means and comprising a first array of electrical interface contacts;

an actuable interface assembly affixed to said support means and comprising a second array of electrical interface contacts each for connection to a corresponding contact in the first array and carrier means for mounting the second array of contacts;

the actuable interface assembly positioning the carrier means in a non actuated condition so that when the connector means is mounted on the support means each of the contacts in the first and second arrays is substantially parallel with the other contacts and is axially elongated along an axis to an exposed and free end and the first and second arrays of contacts are located in mirror image to each other with each contact in the second array spaced apart from the corresponding contact in the first array in both axial and transverse directions by the same amount and in the same direction;

the actuable interface assembly comprising operable means and compound movement cam means connected to the operable means and to the carrier means, the compound movement cam means being operable, as the operable means is continuously moved from a non actuated condition to an actuated condition, for moving the carrier means, starting from the non actuated condition, so that all of the contacts in the second array are first moved parallel with the axes thereof to a position which is opposed in a transverse direction with the free and exposed ends of the corresponding contacts in the first array and are second moved in a substantially transverse direction to the axes thereof into engagement with the free and exposed ends of the corresponding contacts in the first array, the compound movement cam means comprising,

at least one cam member,

means for confining the movement of the cam member in a direction transverse to the axes of the contacts in the second array, the cam member comprising first and second interconnected cam portions for guiding the carrier means, the first cam portion extending at an acute angle to the axes of the contacts and the second cam portion extending substantially transverse to such axes,

side thrust cam means comprising a first cam part affixed to the carrier means and a second cam part carried with the movement of the at least one cam member,

guide means for guiding the movement of the carrier means so that all contacts in the second array move in a plane parallel with the axes of the contacts in the second array,

the operable means moving said cam member to thereby cause the carrier means to first move along the first cam portion until it reaches the second cam portion and then move along the second cam portion, such movement along the first cam portion causing the contacts of the second array to move parallel with the axes of the contacts in the first array to such opposed position and such movement along the second cam portion causing interaction of the first and second cam parts to move the contacts of the second array in a substantially transverse direction to the axes thereof and into such engagement.

4,377,319

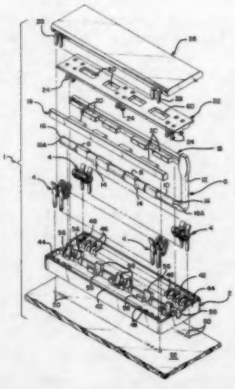
LOW INSERTION FORCE DIP CONNECTOR

Alan R. MacDougall, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 28, 1981, Ser. No. 229,044

Int. Cl.³ H01R *13/629*

U.S. Cl. 339—75 M **4 Claims**



1. A low insertion force connector, including: a housing having parallel rows of contact receiving cavities, electrical contacts in said cavities having resilient receptacle portions normally open to facilitate low insertion force receipt of male electrical leads, and a manually actuated cam for closing said resilient receptacle portions onto said leads to establish electrical connections therewith, characterized in that,

said cam includes a unitary shaft having a transverse projecting lever for rotating said shaft about an axis of rotation, one or more guide keys each projecting radially of said

axis and received slidably along a respective keyway in said housing, and a series of oblong cam surfaces projecting radially of said axis,

a pair of pusher rails slidably supported by said housing and interposed between said receptacle portions and said cam surfaces, whereby said cam surfaces are rotatable with said shaft and urge said rails slidably against said receptacle portions to close the same,

said housing is molded with a series of integral cradles supporting said shaft, and

a cover overlies said shaft and said rails,

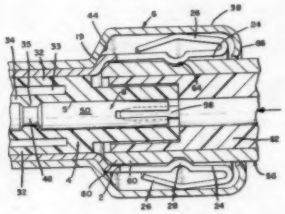
said keys, said cam surfaces and said cradles are serially arranged.

4,377,320

COAXIAL CONNECTOR

John C. Lathrop, Harrisburg, and Ronald C. Laudig, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 26, 1980, Ser. No. 210,694
Int. Cl.³ H01R 13/12
U.S. Cl. 339—177 R **16 Claims**



1. Improved retention means for a connector tubular plug shell which matingly receives a tubular jack body in a forward end, the improvement comprising:

a tubular spring element seated within a forward end of said tubular plug shell, said spring element comprising forward projecting inner leaf springs defining a passageway therebetween for receiving said jack body with interference, and reversely formed outer leaf springs having forward ends integrally joined to respective forward ends of said inner leaf springs, said inner and outer leaf springs being normally spaced apart, whereby upon insertion of said jack body into said passageway between said inner leaf springs, said inner and outer leaf springs compress against an interior wall of said tubular plug shell to exert radial retention forces on said jack body.

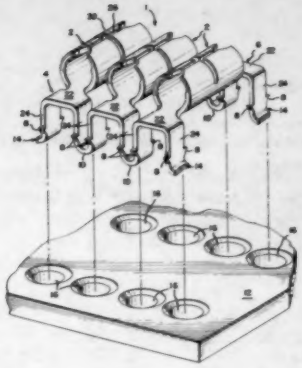
4,377,321

CARRIER MOUNTED TERMINALS

Lawrence P. Weisenburger, Kernersville, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 17, 1980, Ser. No. 207,582
Int. Cl.³ H01R 9/14
U.S. Cl. 339—220 R **3 Claims**

1. A plurality of electrical terminals for connection to a printed circuit board integrally joined together in a serial array by a carrier strip provided with a series of resilient bight portions extending between respective adjacent terminals with the axes of the bight portions extending transversely of a longitudinal axis of the strip, each bight portion having been formed by



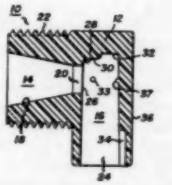
bending the strip back on itself and each bight portion having a projecting leg portion by which said terminals are mounted.

4,377,322

FIBER OPTIC COUPLER

Richard G. Ransley, Auburn, and William H. Sahm, III, Syracuse, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Oct. 27, 1980, Ser. No. 201,350
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.2 **1 Claim**



1. An adapter for connecting an optoelectronic semiconductor device in efficient radiation-coupling relation with a fiber optic waveguide comprising a one-piece plastic body having an externally threaded cylindrical portion provided with a coaxial frustoconical first chamber for receiving the end portion of a fiber optic waveguide,

said body having a second chamber of generally rectangular cross section having a permanently open outer end for direct insertion and withdrawal of a semiconductor device,

said second chamber being arranged generally orthogonal to said first chamber for removable insertion of the semiconductor device therein and communicating adjacent the inner end of one of its sidewalls with said first chamber,

first position-determining projections on the interior sidewalls of said second chamber arranged and adapted for engagement with a semiconductor device inserted in said second chamber so as to align the optoelectronic operative portion of the semiconductor device installed in said second chamber with a fiber optic waveguide installed in said first chamber,

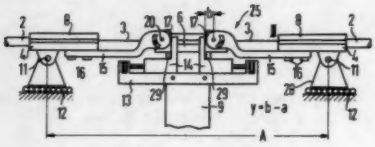
and second position-determining projections on the inner walls of said second chamber frictionally engageable with a semiconductor device inserted therein to determine the

spacing of said device from the end of an optical fiber installed in said first chamber.

4,377,323
SPLICING DEVICE FOR PRODUCING A LIGHT WAVEGUIDE CONNECTION

Bernd Schneider, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 16, 1980, Ser. No. 217,163
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1979, 2951483
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.21 **10 Claims**



1. In a splicing device for connecting light waveguides together utilizing a splicing element having a centering groove for guiding the ends of the light waveguides therein, said splicing device having means for supporting a splicing element, a holding device being disposed on each side of the means for supporting a splicing element, each of said holding devices being mounted for rotation on a horizontal axle and having means for holding an end of a light waveguide at an acute angle to the base of the splicing element, and means for moving the holding device and the means for supporting a splicing element relative to each other to cause introduction of the ends of the light waveguides in the splicing elements so that both ends of the individual light waveguides are moved towards one another in the centering groove of the splicing element to be brought into mutual contact and after securing of the ends together, said holding devices being rotated to coaxially align the cladding of the spliced waveguides for connecting by a bridge element, the improvements comprising means supporting the axle of each of the holding devices for movement in a horizontal plane so that the distance between the axles can be varied and control means for controlling the movement of the axles of the holding device as a function of the angle of inclination of each holding device.

4,377,324
GRADED INDEX FABRY-PEROT OPTICAL FILTER DEVICE

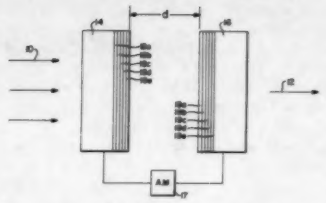
William W. Durand, Edina; Anil K. Jain, New Brighton, and Ronald E. Peterson, Shoreview, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 4, 1980, Ser. No. 175,159
Int. Cl.³ G02B 5/28
U.S. Cl. 350—166 **5 Claims**

1. A Fabry-Perot filter device, comprising:

a pair of low index substrates having a refractive index of less than 2.4 and mounted in parallel relationship so as to present facing sides to each other in an optical path;

a coating on the facing sides of each of said low index substrates, said coating having an increasing index of refraction away from said sides from about that of the substrate adjacent said sides to above 4.0 on said facing sides in increments of from at least 2 steps to continuously with



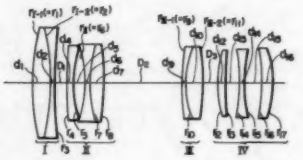
the total coating thickness being on the order of the light wavelength or more; and

adjustment means to adjust the distance between said faces.

4,377,325
BRIGHT AND COMPACT OPTICAL-COMPENSATION TYPE ZOOM LENS SYSTEM

Takase Hiroshi, Hachioji, and Tadashi Kimura, Tokyo, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 17, 1981, Ser. No. 235,429
Claims priority, application Japan, Feb. 18, 1980, 55-18849
Int. Cl.³ G02B 15/14
U.S. Cl. 350—423 **25 Claims**



1. A bright and compact optical-compensation type zoom lens system comprising a first lens group I having positive refractive power, a second lens group II having negative refractive power, a third lens group III having positive refractive power, and a fourth lens group IV having positive refractive power, said zoom lens system being arranged to carry out zooming by keeping said second lens group II and said fourth lens group IV fixed and integrally moving said first lens group I and said third lens group III, said first lens group I comprising a cemented doublet consisting of a positive lens element and negative lens element, said second lens group II comprising at least one positive lens element and at least one negative lens element and comprising a cemented doublet having the surface on the object side thereof concave toward the object side, said third lens group III comprising a cemented doublet consisting of a positive lens element and negative lens element, said fourth lens group IV comprising at least one positive lens component and at least one negative lens component, said zoom lens system satisfying the following conditions (1) through (6):

$$0.5F_W < |F_{II}| < 1.0F_W \quad (1)$$

$$0.6F_W < F_{III} < 1.5F_W \quad (2)$$

$$0.6F_W < r_{L1} < 2.0F_W \quad (3)$$

$$0.4F_W < |r_{III}| < 1.2F_W \quad (4)$$

$$\Delta\bar{N}_{II} + \Delta\bar{N}_{III} \leq 0.4 \quad (5)$$

$$\Delta\nu_I > 15 \quad (6)$$

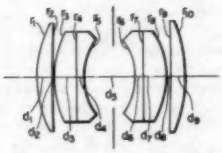
wherein reference symbol F_W represents the shortest focal length of the lens system as a whole, reference symbol F_{II} represents the focal length of the second lens group II, reference symbol F_{III} represents the focal length of the third lens group III, reference symbol r_{I-1} represents the radius of curvature of the surface on the object side of the first lens group I, reference symbol r_{II} represents the radius of curvature of the surface on the object side of the cemented doublet constituting the second lens group II, reference symbol $\Delta\overline{N}_{II}$ represents the difference between the mean value $\overline{N}'_{II}$ of refractive indices of positive lenses constituting the second lens group II and mean value $\overline{N}''_{II}$ of refractive indices of negative lenses constituting the second lens group II, reference symbol $\Delta\overline{N}_{III}$ represents the difference between the mean value $\overline{N}''_{III}$ of refractive indices of negative lenses constituting the third lens group III and mean value $\overline{N}'_{III}$ of refractive indices of positive lenses constituting the third lens group III, and reference symbol $\Delta\nu_I$ represents the value obtained by subtracting the Abbe's number ν''_I of the negative lens constituting the first lens group I from the Abbe's number ν'_I of the positive lens constituting the first lens group I.

4,377,326

MACRO LENS SYSTEM

Yuko Kobayashi, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1981, Ser. No. 251,536
Claims priority, application Japan, Apr. 7, 1980, 55-45391
Int. Cl.³ G02B 9/42
U.S. Cl. 350—471 **5 Claims**



1. A macro lens system comprising a first positive meniscus lens component having a convex surface on the object side, a second naegative cemented meniscus lens component consisting of a positive element and a negative element and having a convex surface on the object side, a third negative cemented meniscus lens component consisting of a positive element and a negative element and having a convex surface on the image side, and a fourth positive meniscus lens component having a convex surface on the image side, said macro lens system satisfying the following conditions:

(1) $1.7<n_1,n_6$

(2) $50<\nu_1,\ \nu_6,\ 60<\nu_2,\nu_5$

(3) $0.118f<d_3+d_4<0.128f$

(4) $0.184f<d_5<0.211f$

(5) $1.0<|r_5/r_6|<1.10$

(6) $1.2<|r_{10}/r_1|<1.36$

(7) $1.0<|r_8/r_3|<1.1$

(8) $0.95<(d_3+d_4)/(d_6+d_7)<1.04$

(1) $1.7<n_1,n_6$

(2) $50<\nu_1,\ \nu_6,\ 60<\nu_2,\nu_5$

(3) $0.118f<d_3+d_4<0.128f$

(4) $0.184f<d_5<0.211f$

(5) $1.0<|r_5/r_6|<1.10$

(6) $1.2<|r_{10}/r_1|<1.36$

(7) $1.0<|r_8/r_3|<1.1$

(8) $0.95<(d_3+d_4)/(d_6+d_7)<1.04$

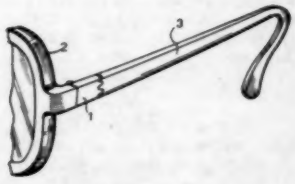
wherein the reference symbol f represents focal length of said macro lens system as a whole, the reference symbols n_1 and n_6 designate refractive indices of said first lens component and said fourth lens component respectively, the reference symbols ν_1, ν_2, ν_5 and ν_6 denote Abbe's numbers of said first lens component, the object side element of said second lens component, the image side element of said third lens component and said fourth lens component respectively, the reference symbols d_3, d_4, d_6 and d_7 represent thicknesses of both the elements of said second lens component and both the elements of said third lens component respectively, the reference symbol d_5 designates airspace reserved between said second and third lens components, and the reference symbols r_1, r_3, r_5, r_6, r_8 and r_{10} denote radii of curvature on the object side surface of said first lens component, the object side surface and image side surface of said second lens component, the object side surface and image side surface of said third lens component and the image side surface of said fourth lens component respectively.

4,377,327

SPECTACLE FRAMES

Giuseppe Zomer, Via Cerrone 4, Villar Dora (Turin), Italy

Filed Aug. 28, 1980, Ser. No. 182,189
Claims priority, application Italy, Feb. 15, 1980, 67231 A/80
Int. Cl.³ G02C 5/16, 5/14
U.S. Cl. 351—119 **8 Claims**



1. A side arm for a spectacle frame, said side arm comprising a

front part arranged to be hinged to the front of the frame,

a rear part shaped to engage over the ear of the wearer and articulated at its forward end to the adjacent rear end of said front part, and

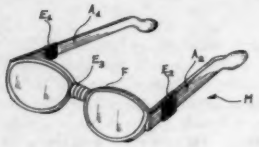
a longitudinal reinforcing element which at least in the zone of articulation of said front and rear parts is in the form of a flexible lamina situated in the vertical longitudinal median plane of the spectacle side arm, the adjacent ends of said front and rear parts being so formed that their facing surfaces are spaced from each other by a distance which progressively increases as the distance from said median plane increases, and the said adjacent ends of the front and rear side-arm parts each being formed with tenons and mortices which extend transversely to the longitudinal direction of said side arm and respectively engage with the mortices and the tenons of the other said side-arm part, each said tenon having two surfaces which at least partially face upwards and downwards respectively.

4,377,328

SPECTACLE FRAME

Renato Ferrandi, Brescia, Italy, assignor to European Optics S.p.A., Brescia, Italy

Filed May 27, 1981, Ser. No. 267,574
Claims priority, application Italy, Mar. 31, 1981, 21344/81[U]
Int. Cl.³ G02C 5/16, 5/06
U.S. Cl. 351—126 5 Claims



1. A spectacle frame comprising:

(a) first and second rim portions for holding lenses therein;

(b) first and second pin means, said first and second pin means each having an embedded end portion completely and fixedly embedded in a corresponding one of said first and second rim portions, and having an extending portion extending from said corresponding first and second rim portions, said extending portions having screw threads thereon;

(c) helical spring means having a length greater than the sum of the lengths of said extending portions, wherein the extending portions of said first and second pin means each threadedly engage a predetermined length of said helical spring means thereby coupling said first and second rim portions together for forming the bridge of said frame, wherein the fixed embedding of said first and second pin means in said rim portions prevents the further relative rotation of said first and second pin means with respect to said rim means of the assembly;

(d) nose piece means mounted on said first and second rim means for supporting said first and second rim means on the nose of a user; and

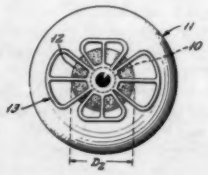
(e) first and second temple piece means each having one end coupled to a corresponding one of said rim means, said temple piece means being adapted to engage the ears of a user to support the frames thereon.

4,377,329

CONTACT LENS OR THE LIKE

Stanley Poler, 78 E. Second St., New York, N.Y. 10003

Filed Feb. 26, 1980, Ser. No. 124,941
Int. Cl.³ G02C 7/04
U.S. Cl. 351—160 R 33 Claims



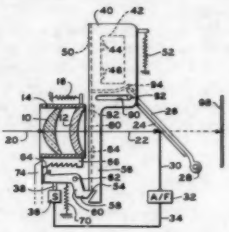
1. A contact lens assembly adapted for self-adherent removable mounting to the cornea of an eye, comprising a circular lens element, and haptic means peripherally engaging and mounting said lens element, said haptic means being of sheet material including integrally formed axially compliant radially outward foot formations extending outward of said lens element at angularly spaced locations, said foot formations being substantially fenestrated and being of such compliant action as to bendably deform in continuous smooth conformance to the surface curvature of the cornea and to adhere thereto solely through contact with natural moisture of the surface of the cornea.

4,377,330

LOW COST AUTO FOCUS SYSTEM IMPROVEMENT

Norman L. Stauffer, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 18, 1981, Ser. No. 307,412
Int. Cl.³ G03B 13/00, 9/08, 9/22
U.S. Cl. 354—25 14 Claims



1. Apparatus for use in a camera having a film plane, a taking lens moveable to a focus position where radiation from a remote object may pass through the taking lens and along an optical path to be focussed on the film plane and an auto focus sensor operable to produce an output indicative of the focus position, comprising:

shutter means moveable into and out of the optical path;

reflecting means moveable into and out of the optical path; and

actuation means operable to move the reflecting means into the optical path to reflect radiation from the remote object to the auto focus sensor when the shutter means is moved out of the optical path and to move the reflecting means out of the optical path when the shutter means is moved into the optical path.

4,377,331

ATTACHMENT FOR ELIMINATING AMMONIA FUMES FROM DIAZO COPIERS

Terry G. Seelenbinder, Elk Grove Village; Richard W. Jackson, Barrington, and Thomas D. Kajohn, Jr., Buffalo Grove, all of Ill., assignors to AM International, Inc., Chicago, Ill.

Filed Jun. 29, 1981, Ser. No. 278,109
Int. Cl.³ G03D 7/00
U.S. Cl. 354—300 7 Claims

1. A copying machine employing a gas generating development medium comprising:

a housing; and

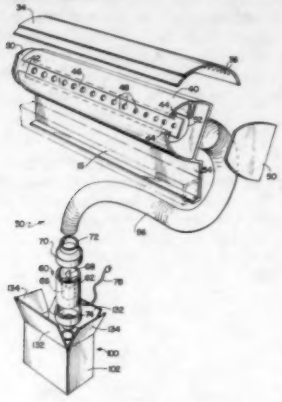
means for scavenging fugitive gas fumes emitted from said development medium from said housing, said scavenging means comprising:

an elongated intake manifold mounted in said housing, said manifold comprising an extruded tubular element with an elongated opening on one side thereof, said opening being bounded by grooved beads, and a strip of material having edges supported in said grooved beads, said strip having air intake openings spaced therealong, and an output opening in said manifold opposite said elongated opening located at one end of said tubular element;

a blower including a blower housing for evacuating said fugitive gas fumes from said copy machine housing, said blower housing having an intake end and an exhaust end;

a flexible hose connected at one end to said output opening

in said manifold and at the other end to said intake end of said blower housing;



said blower housing including a connecting means at the exhaust end thereof connectable with a disposable and replacable gas treatment cartridge, said cartridge providing a support for said blower housing.

4,377,332

DEVELOPING DEVICE

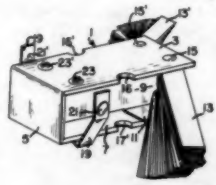
Yasuyuki Tamura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 10, 1980, Ser. No. 138,909

Claims priority, application Japan, Apr. 20, 1979, 54/48718; Feb. 12, 1980, 55/16453

Int. Cl.³ G03G *15/09*

U.S. Cl. 355—3 DD **23 Claims**



1. A developing device for developing a latent image on a latent image bearing member by imparting a one-component toner to the latent image, said device comprising:

means for supplying one-component magnetic toner;

a member for supporting on its surface toner supplied from said supply means;

magnetic field generating means disposed within said supporting member; and

a thickness controlling member disposed in proximity to said supporting member for controlling the thickness of a layer of toner formed on the surface of said supporting member;

wherein said developer supporting member has concavo-convexities on the surface thereof, said concavo-convexities including at least repeating peaks and valleys formed along the direction of movement of the toner, said concavo-convexities having a depth of 0.2–10μ.

4,377,333

RECORDING APPARATUS

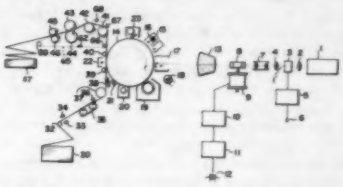
Takao Tsuji; Junji Ichikawa, both of Kawasaki; Hiroo Ichihashi, Tokyo; Yoshinori Sugiura, Kawasaki; Takashi Nakano, and Kazuhiro Hirayama, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 931,928, Aug. 8, 1978, abandoned. This application Sep. 5, 1980, Ser. No. 184,563

Claims priority, application Japan, Aug. 12, 1977, 52-96716; Sep. 5, 1977, 52-106481; Sep. 5, 1977, 52-106482; Sep. 8, 1977, 52-108211; Sep. 14, 1977, 52-108567; Sep. 14, 1977, 52-110941

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 SH **13 Claims**



13. A transfer material transporting device, usable with a recording apparatus capable of automatically loading a continuous transfer material and including means for transferring an image formed on an image holding member onto the continuous transfer material, said device comprising:

means for transporting said continuous transfer material along a path therefore through said transferring means;

at least a set of members for opening and closing said path, said opening and closing members being adapted to open said path so as to form a space wide enough to accommodate said continuous transfer material, wherein said opening and closing members comprise fixing means, having a closable passage for the transfer material, for fixing the transferred image on said continuous transfer material;

a transfer holding member for passing through the path between said opening and closing members in the open state thereof while supporting a portion of said continuous transfer material and then stopping at a predetermined position; and

an endless rotary member adapted for performing a circulating motion while supporting said transfer material holding member.

4,377,334

MAGNET ROLL DEVELOPING UNIT

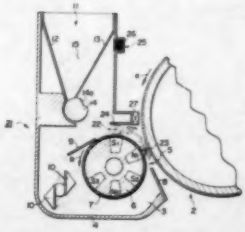
Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Oct. 29, 1980, Ser. No. 201,970

Claims priority, application Japan, Jan. 11, 1980, 55/1360

Int. Cl.³ G03G *15/09*

U.S. Cl. 355—3 DD **14 Claims**



1. A magnet roll developing unit comprising:

a closed housing containing a magnetic developer which includes a magnetic powder and a toner and having a developing opening formed therein at a location opposite to a surface to be developed;

a magnet roll fixedly mounted in the housing and carrying a developing magnetic pole and a plurality of conveying magnetic poles, said developing pole being disposed to be opposite to the surface to be developed through the developing opening;

a cylindrical, non-magnetic sleeve disposed in surrounding relationship with the magnet roll and having its lower portion immersed in a quantity of magnetic developer whih is received in the housing, said sleeve being disposed for rotation in one direction so that the magnetic developer attracted thereon by the magnetic force from the conveying poles is conveyed thereon upwardly toward the developing opening and is formed into a first tuft-shaped developer brush in the region of the developing opening under the magnetic influence of the developing pole;

a doctor blade for controlling the height of the magnetic developer layer formed and retained on the sleeve under the magnetic influence of the magnet roll as the developer enters into the developing opening;

a guide vane mounted on a member which defines one end of the developing opening being disposed close to or for contact with the free end of a second tuft-shaped developer brush formed by the magnetic field of one of the conveying poles which is located next to the developing pole, as viewed in the direction of rotation of the sleeve, said last-mentioned one of said conveying poles being arranged across from said guide vane, the guide vane guiding all toner returned to said housing to move between said guide vane and said non-magnetic sleeve and cooperating with the moving second tuft-shaped developer brush to provide an air pump action which develops a suction condition on the side of the second tuft-shaped developer brush facing the surface to be developed to draw the air containing the toner in suspension in the region of the developing opening into the housing;

the spacing between the sleeve and the guide vane causing the central portion of the second tuft-shaped developer brush to block the flow of air other than that contained in said second tuft-shaped developer brush to enhance the positiveness and effectiveness of the suction and pumping actions and to eliminate the need for additional air pumping means for said developer housing;

a vent formed in the housing for reducing the internal air pressure within the housing which internal air pressure increases as a result of the air pump action, and in order to enhance the air pump action; and

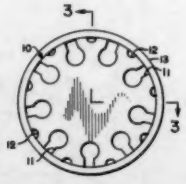
toner removal means for trapping the toner which is suspended in the effluent flow moving toward and through the vent.

4,377,335

CRYOGENICALLY ASSEMBLED ROLLS

Ronald A. Fannon, Chase Mills, and Dale B. Parks, West Henrietta, both of N.Y., assignors to Bunnington Corporation, Rochester, N.Y.

Filed Jun. 8, 1981, Ser. No. 271,160
Int. Cl.³ G03G *15/20*
U.S. Cl. 355—3 FU **9 Claims**



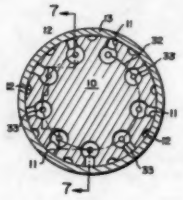
1. Pressure roll apparatus comprising a cylindrical core of material having a plurality of axial slots in side-by-side relationship, said axially slots being alternatively bordered by an array of cavities having a depth substantially less than that of said axial slots, a tubular sleeve having an inside diameter which is less than the outside diameter of said core at ambient temperature and greater than the outside diameter of said core at cryogenic temperatures, said core being disposed inside said sleeve and assembled thereto upon expansion thereof between said cryogenic and ambient temperatures.

4,377,336

HEATED PRESSURE ROLLS

Dale B. Parks, Rochester; Ronald A. Fannon, Chase Mills, and Ronald T. Kosmider, East Rochester, all of N.Y., assignors to Bunnington Corporation, Rochester, N.Y.

Filed Jun. 8, 1981, Ser. No. 271,163
Int. Cl.³ G03G *15/20*
U.S. Cl. 355—3 FU **11 Claims**



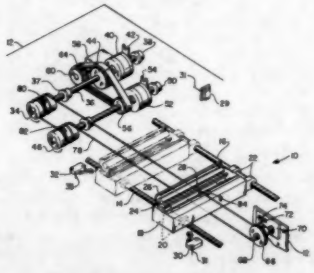
1. Pressure roll apparatus comprising a cylindrical core having a general circular configuration and provided with an array of axial slots comprising circular sectors, said axial slots being alternately bordered by an array of cavities having a depth substantially less than that of said axial slots, a heating element in said slots, and a shell around said core.

4,377,337

DOCUMENT SCANNING APPARATUS FOR AN ELECTROSTATIC COPIER

Christian A. Beck, Ridgefield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 12, 1981, Ser. No. 223,978
Int. Cl.³ G03G *15/28, 15/32*
U.S. Cl. 355—8 **6 Claims**



1. A document scanning apparatus for a copier comprising:

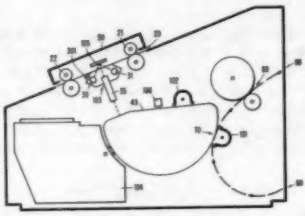
a carriage, means for supporting said carriage for longitudinal movement along a path, first and second switches located along said path and spaced from one another, said carriage being located intermediate said switches, drive means, first and second clutch means, a first shaft received within said first clutch means, a second shaft received within said second clutch means, first and second drums

supported upon said first and second shafts, respectively, for rotation therewith, a cable drivingly connected directly to said first and second drums and said carriage, said first clutch means transmitting drive to said first shaft rotatably driving said first drum in a first rotational direction to cause said cable to pull said carriage in a first longitudinal direction upon said first clutch means being enabled and said second clutch means transmitting drive to said second clutch means transmitting drive to said second shaft rotatably driving said second drum in said first rotational direction to cause said cable to pull said carriage in a second longitudinal direction upon said second switch being enabled.

4,377,338
METHOD AND APPARATUS FOR COPIER QUALITY MONITORING AND CONTROL

Larry M. Ernst, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 7, 1981, Ser. No. 291,136
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 D **10 Claims**



1. The method of establishing toner level standards for a copier which has a moving photoconductor, means for charging said photoconductor for receiving an electrostatic image, an illumination lamp arranged for illuminating said photoconductor, a developer for applying toner to said photoconductor and means for measuring light reflected from said photoconductor comprising the steps of:

charging said photoconductor for accepting images;

controlling said lamp and said developer for selectively creating sequential areas on said photoconductor ranging from an area of maximum toner application to an area of minimum toner application;

sensing the output of said measuring means where said output indicates light reflected from said photoconductor sequential areas as they pass said measuring means; and

storing signals corresponding to said measuring means output correlated to said sequential areas on said photoconductor,

whereby operation of said copier is at least partially determinable by subsequent comparisons of said measuring means output with said stored signals.

4,377,339
PROJECTION OPTICAL LITHOGRAPHY APPARATUS

Richard A. Coppock, San Jose, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Aug. 3, 1981, Ser. No. 289,129
Int. Cl.³ G03B *27/32, 27/52*
U.S. Cl. 355—27 **1 Claim**

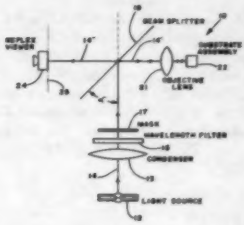
1. An optical system for exposing and developing a printed circuit photoresist layer having a thickness of approximately one micron, comprising

a light source and a condenser lens and an objective lens and a substrate arranged in series along an optical axis,

said substrate having a surface covered by said photoresist layer, said layer having an index of refraction n_R,

a planar mask disposed transversely of said axis between said lenses, said mask having an image adapted to be optically projected by said light source onto said photoresist layer of the substrate,

a transparent gate adjacent to the side of said layer opposite from the substrate, said gate comprising an optical window aligned with said axis and a liquid engaging said side of the layer and having an index of refraction n_L closer to n_R than the index of refraction of air and being characterized by the capability of photographically developing said photoresist layer upon exposure of the latter to said light source, said liquid being retained by said window,



a beamsplitter comprising a partially-transmissive partially-reflective mirror disposed on said optical axis between said mask and said objective lens whereby a portion of the light from said source reflected from said substrate passes through said beamsplitter,

a viewing device aligned with said optical axis and having an image viewing plane optically coplaner with the plane of the said mask, and

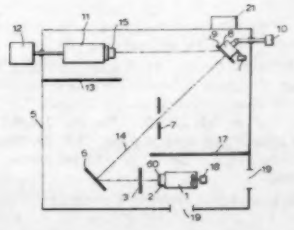
said viewing device being positioned to receive the reflected light passing through said beamsplitter,

said image viewing plane being optically spaced from said substrate by a distance equal to the optical spacing between said substrate and said mask.

4,377,340
METHOD AND APPARATUS FOR DETECTING PARTICLES ON A MATERIAL

Gary P. Green, Marlborough; Charly D. Allemand, Newtonville; David L. Brewer, Stow; Hitoshi Iida, Bedford, and Mario A. Maldari, Stow, all of Mass., assignors to Hamamatsu Systems, Inc., Waltham, Mass.

Filed Oct. 24, 1980, Ser. No. 200,566
Int. Cl.³ G01N *21/47*
U.S. Cl. 356—237 **16 Claims**



1. A method of detecting contaminant particles on a material, comprising the steps of

A. providing a substantially light reflectionless interior wherein detection is carried out;

B. directing a collimated light beam onto a selected area of a surface of said material, whereby said particles will

scatter light with intensities proportional to the sizes of said particles;

C. adjusting the position of said surface to cause the collimated light to be reflected substantially back to the source without any substantial reflections or scatter;

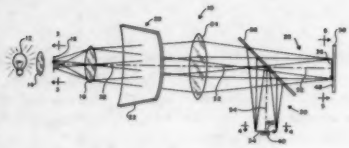
D. focusing a light sensitive TV camera on said surface of said material to detect the scattered light indicative of said particles; and

E. processing signals received by said camera from said scattered light thereby to effect measurement, counting and determination of the location of said particles.

4,377,341
SYSTEM FOR MEASURING ANGULAR DEVIATION IN A TRANSPARENCY

Harry L. Task, Dayton; Louis V. Genco, Enon; Kenneth L. Smith, and Albert G. Dabbs, both of Dayton, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 11, 1981, Ser. No. 242,816
Int. Cl.³ G01N *21/88*
U.S. Cl. 356—239 **6 Claims**



1. In an improved system for measuring angular deviation in a transparency, the combination comprising:

(a) an opaque object having a transparent pattern formed therein by a pair of transversely-aligned segments;

(b) an incoherent light source for illuminating said object;

(c) means for projecting an image of said transversely-aligned segments through a test region of space;

(d) means for receiving said projected image and for transmitting it, after having removed any effects of lateral displacement of the image, into first and second channels; and

(e) first and second linear detector arrays, each being positioned in one of said first and second channels for detecting a lateral shift in the position of the image of said transparent pattern segments due to angular deviation for a particular point on said transparency, the lateral shift occurring, if at all, when the transparency is inserted into the test area.

4,377,342
ZEEMAN ATOMIC ABSORPTION SPECTROPHOTOMETER

Hideaki Koizumi, Tokyo, and Hitoshi Sawakabu, Katsuta, both of Japan, assignors to Hitachi, Ltd. and Hitachi Naka Seiki Kabushiki Kaisha, both of Tokyo, Japan

Filed Feb. 23, 1981, Ser. No. 236,995
Claims priority, application Japan, Feb. 22, 1980, 55-20439
Int. Cl.³ G01J *3/42*; G01N *21/74*
U.S. Cl. 356—307 **40 Claims**

1. A Zeeman atomic absorption spectrophotometer comprising:

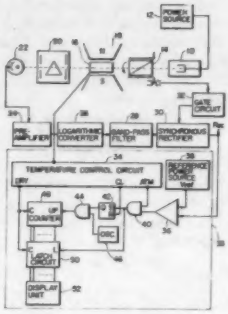
a light source;

an atomization section irradiated with the light from said light source including means for atomizing a sample;

a detector coupled to receive the light emitted from said light source and then subjected to atomic absorption in said atomization section, and to convert the light into an electric signal;

means for generating a pair of Zeeman split light components emitted from the light source including means for applying a magnetic field to the light source;

means coupled to the output of said detector for processing the detected signal and producing an atomic absorption signal for the sample, which signal is corrected for background absorption; and

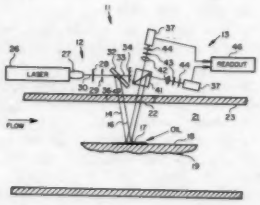


means for measuring, during a stage of atomization of the sample in said atomization section, the length of time between an instant at which the intensity of the background absorption-corrected atomic absorption signal initially reaches a predetermined level and an instant at which the intensity of the same signal reaches the same predetermined level for the last time during said stage of atomization.

4,377,343
DUAL-BEAM SKIN FRICTION INTERFEROMETER

Daryl J. Monson, Cupertino, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 10, 1981, Ser. No. 282,192
Int. Cl.³ G01B *9/02, 11/06*
U.S. Cl. 356—357 **8 Claims**



1. Apparatus for measuring the thickness change of an oil film on a light reflective surface while said oil film is flowing comprising:

means for fixedly directing first and second parallel coherent light beams of a known wavelength on said oil film at points A and B, respectively, for reflection by said oil film and said surface adjacent thereto, said beams being a known distance apart and said first beam being upstream from said second beam;

means for rotating the plane of polarization of said first beam 90° with respect to the plane of polarization of said second beam;

means for separating the two beams reflected from said oil film and said surface into paths normal to each other,

light detection means interposed in each path for generating a signal representative of the beam intensity, and

means for recording each signal so that the frequency of

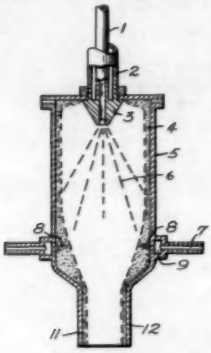
interference fringes at said points A and B may be determined.

4,377,344

APPARATUS FOR BRINGING LIQUIDS IN CONTACT

Klaus Hentschel, Hanau; Friedrich Bittner, Bad Soden; Gerd Schreyer, Hanau, and Georg Franz, Niederau, all of Fed. Rep. of Germany, assignors to Degussa AG, Frankfurt, Fed. Rep. of Germany

Filed Nov. 15, 1979, Ser. No. 94,803
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1978, 2850271
Int. Cl.³ B01F 5/20
U.S. Cl. 366—173 4 Claims



1. An apparatus for bringing into contact liquids at least one of which is viscous, the apparatus consisting essentially of a tubular container, a first spray nozzle means adapted for the introduction of a liquid in the upper portion of the container, at least one other nozzle means lower than the first spray nozzle means for introducing a different liquid, the tubular container being closeable at the top thereof and downwardly from said other nozzle means being constricted in a breast shaped manner to form a discharge opening, said constriction being in the form of a flat S curve going from the wall of the tubular container to the discharge opening, said other nozzle means consisting essentially of at least one tangential spray means arranged in at lease one row, said other nozzle means being slightly above said constriction and being directed in the direction of the upper closeable device or said first spray nozzle means.

4,377,345

ALARM SIGNALING CIRCUIT FOR TIMEPIECE

Shinji Yamada, and Mitsuru Nagoya, both of Kitakatsushika, Japan, assignors to Rhythm Watch Company, Limited, Tokyo, Japan

Filed Dec. 24, 1980, Ser. No. 219,884
Claims priority, application Japan, Dec. 28, 1979, 54-170967
Int. Cl.³ G04B 23/02; G04C 21/00
U.S. Cl. 368—245 6 Claims

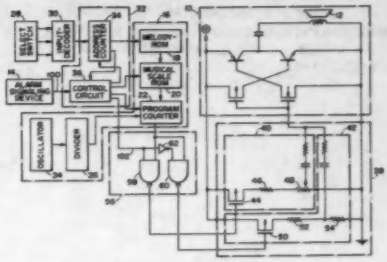
1. An alarm signaling circuit for a timepiece having settable first and second alarm signal periods and which is capable of external and optional determination of alarming volume comprising:

a volume control circuit having a variable volume controller which can be externally adjustable and a fixed volume setting means which determines a constant volume;

a change over switch which selectively changes between said volume controller and said fixed volume setting means in response to a change over control signal; and

a change over control circuit which has a timer section for measuring alarm signaling time and for supplying said change over control signal to said change over switch after a predetermined passage of time from a start of an alarm signaling;

whereby alarm signaling action at a certain volume is established by said variable volume controller during said first alarm signaling period and alarm signaling action at a fixed alarming volume is determined by said fixed volume setting means in a consecutive said second alarm signaling period.

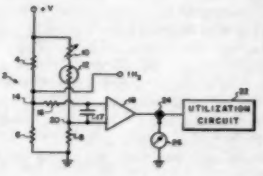


4,377,346

THERMOSTATIC APPARATUS

Jack L. Beaver, Minneapolis; Jerry P. Schroeder, Minnetonka, and John M. Whitney, Bloomington, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 4, 1981, Ser. No. 270,461
Int. Cl.³ G01K 15/00; G05D 23/00
U.S. Cl. 374—1 10 Claims



1. A thermostatic assembly comprising:

an electronic temperature sensing circuit means including at least one temperature sensitive element and temperature selective set point potentiometer;

a signal responsive device connected to be responsive to an output signal from said temperature sensing circuit means;

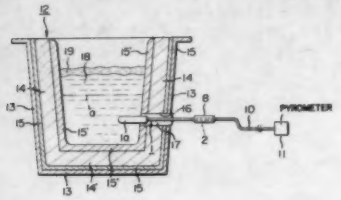
said potentiometer having an adjustment shaft, a knob frictionally coupled to said shaft and having a pointer thereon for indicating a preferred set point for said thermostatic assembly; and

means for adjusting said potentiometer while holding said knob stationary at a predetermined setpoint indicating position representative of ambient temperature to calibrate said thermostatic assembly at said ambient temperature.

4,377,347
METHOD FOR MEASURING TEMPERATURE OF MOLTEN METAL RECEIVED IN VESSEL

Masayuki Hanmyo; Masaru Ishikawa, and Seishi Mizuoka, all of Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 16, 1980, Ser. No. 160,062
Claims priority, application Japan, Jul. 9, 1979, 54-85846
Int. Cl.³ C21D 11/00; G01K 1/14
U.S. Cl. 374—139 3 Claims



1. In a method for measuring the temperature of a molten metal received in a casting vessel, the molten metal received in said casting vessel having molten slag floating on the upper surface thereof, which comprises:

covering at least the tip portion of a probe comprising a thermocouple housed in an alumina protecting tube, from inside to outside, with a ceramic fiber and a quartz glass layer over said ceramic fiber; attaching said covered probe to the side wall of the casting vessel so that said probe projects into said casting vessel; pouring molten metal into said casting vessel to immerse said probe in said molten metal; and continuously measuring, by means of said immersed probe, the temperature of said molten metal poured into said casting vessel and in which said probe is immersed;

the improvement comprising:

attaching said probe to said side wall of said casting vessel through an opening in said side wall of said vessel at a position spaced from the bottom of the casting vessel and below a preselected allowable lowest level of the molten metal which is higher than said opening when the molten metal is received in said casting vessel; and

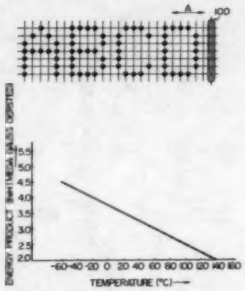
the level of said molten metal received in said casting vessel always being maintained higher than or at least equal to said preselected allowable lowest level of molten metal by pouring in additional molten metal as needed, so that said probe does not contact the molten slag which floats on the surface of the molten metal so that said probe is not eroded by the molten slag which floates on the surface of the molten metal, whereby the temperature of the molten metal in said casting vessel is accurately measured substantially without being affected by the influence of the molten slag contacting said probe or deteriorating said probe.

4,377,348
PRINTER HEAD FOR SERIAL DOT PRINTER

Minoru Isobe; Hiroshi Kikuchi; Minoru Teshima, all of Tokyo, and Tadasi Kodama, Sakura, all of Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1981, Ser. No. 244,077
Claims priority, application Japan, Mar. 27, 1980, 55-38176
Int. Cl.³ B41J 3/12
U.S. Cl. 400—124 6 Claims

1. In a printer head for a mosaic printing comprising of a first circular yoke plate; a cylindrical permanent magnet magnetized in an axial direction positioned on said first yoke plate; the permanent magnet having the characteristics that the flux generated by the permanent magnet decreases as the temperature increases; a ring shaped second yoke plate positioned on said permanent magnet; a plurality of electromagnets each having a column core and a coil wound on the column core, the electromagnets being positioned in a circle on said first yoke plate with predetermined angle intervals therebetween; an armature-print-needle assembly including a disk shaped circular resilient spring having a plurality of inwardly extending projections, a plurality of armatures each fixed on a corresponding projection of said spring and a plurality of print needles each fixed to a corresponding armature so that the print needle extends perpendicular to the plane of the spring; a guide frame covering said armature-print-needle assembly said guide frame having a thin linear slit for passing therethrough the tops of said print needles; wherein a first substantially closed magnetic path is formed from said permanent magnet through said second yoke plate, said armatures, said electro-



magnets and said first yoke plate to said permanent magnet such that an armature together with the corresponding print needle are attracted to the corresponding electromagnet by the magnetic flux circulating in said first magnetic path and said armature and the corresponding print needle are released by the force of the spring upon application of an electric current to the coil of the corresponding electromagnet to print a dot; the improvment wherein a cylindrical adjusting yoke means is coupled to said first yoke plate, said permanent magnet and said second yoke plate for forming a second closed magnetic path from said permanent magnet through the second yoke plate, the adjusting yoke means and the first yoke plate to the permanent magnet, said adjusting yoke means having a magnetic characteristic wherein the magnetic reluctance of said adjusting yoke means increases as the temperature of said adjusting yoke means increases.

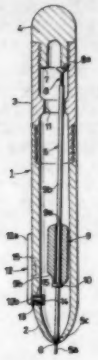
4,377,349
BALL POINT PEN

Shusaku Kunii, 39-36, Nishishinjuku 4-Chome, Shinjuku-Ku, Tokyo, Japan

Filed Jun. 12, 1981, Ser. No. 273,134
Int. Cl.³ B43K 7/12
U.S. Cl. 401—115 7 Claims

1. A ball point pen comprising: an elongated main body having an elongated central bore therewithin, said central bore having a laterally inwardly extending, engaging step located near to but spaced longitudinally inwardly from one longitudinal end of said central bore, said main body having a through hole of smaller size than said central bore and extending from the opposite longitudinal end of said central bore; an elongated cylindrical ink cartridge having a stopper intermediate its opposite longitudinal ends and having a writing tip extending longitudinally from one longitudinal end of said cartridge and adapted to be extended through said through hole, said cartridge being disposed within said central bore and being movable both laterally and lengthwise in said central bore, said cartridge and said writing tip being movable between a first retracted position in which said cartridge and said writing tip

are entirely received within said central bore and are substantially coaxial therewith and a second extended position in which said writing tip projects through said through hole and said cartridge is inclined with respect to the axis of said central bore and the other longitudinal end of said cartridge abuts against said step; and an elongated cylindrical weight having an elongated central hole, the axis of which is coaxial with the axis of said cartridge, said cartridge extending through said central hole with the wall defining said central hole closely surrounding the external wall of said cartridge so that said



weight is supported on said cartridge for closely guided sliding movement, by gravity, in a direction lengthwise of and coaxial with said cartridge between a first position in which said weight is located close to said other longitudinal end of said cartridge when said cartridge is in said first retracted position and a second position in which said weight abuts against said stopper when said cartridge is in said second extended position, the center of gravity of said weight being laterally offset from the axis of said central hole in order continuously to maintain said cartridge inclined with respect to the axis of said central bore when said cartridge is in said second extended position.

4,377,350

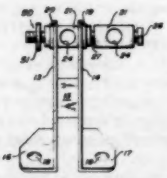
PIVOT FOR DAMPER ASSEMBLY

Louis Josephson, Yonkers, N.Y., assignor to American Hardware & Paint Co., Inc., Elizabeth, N.J.

Continuation-in-part of Ser. No. 190,394, Sep. 24, 1980. This application Aug. 13, 1981, Ser. No. 292,528

Int. Cl.³ F16C *11/06*; F16D *1/12, 3/00*

U.S. Cl. 403—161 **4 Claims**



1. A side-by-side pair of cylindrical pivots, each of said pivots having a cross hole extending therethrough and a threaded axial bore at each end thereof communicating with said cross hole, said pivots being joined together by means of a threaded rod having a flange centrally positioned along the length thereof.

4,377,351

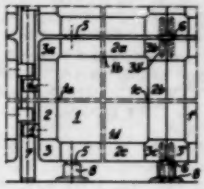
HOLDING DEVICE

Kurt L. Ohlson, Vändelsö Skolväg 104, 136 69 Handen, Sweden

Filed Oct. 15, 1980, Ser. No. 197,070

Int. Cl.³ F16B *1/00*

U.S. Cl. 403—348 **1 Claim**



1. A holding arrangement intended to hold a first element to a second element, comprising a first member for co-action with said first element, a second member for co-action with said second element, said first member including a peg having different cross sections formed in two perpendicular planes such that when said holding arrangement is rotated about an axis to a first position of rotation relative to said first element the peg is able to enter a slot of a recess in said first element and when said holding arrangement is rotated to a second position of rotation said peg clamps said holding arrangement to said first element, two mutually perpendicular surfaces producing a clamping force required to hold said first element and said holding arrangement together and extending perpendicular to the axis of rotation such that the clamping force is directed substantially parallel to said axis of rotation, a rear portion of said recess remote from said slot having wall surfaces which are parallel to said axis of rotation, a large cross-section of said peg clamping against said wall surfaces with a force acting perpendicular to the axis of rotation.

4,377,352

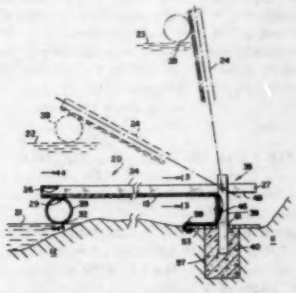
SELF-ACTUATING WATER CONTAINMENT BARRIER

Charles B. Goodstein, 5706 Guava Dr., Tamarac, Fla. 33319

Filed Jan. 2, 1981, Ser. No. 222,165

Int. Cl.³ E02B *7/20*

U.S. Cl. 405—115 **8 Claims**



1. A barrier comprising a rigid stanchion;
means to mount said stanchion in a body of water so that said stanchion is pivotally upwardly movable;
said stanchion comprising floatation means mounted therewith so as to float on said body of water;
further comprising a plurality of said stanchions, and sheeting, and means to mount said sheeting to said stanchions so as to form a continuous barrier; further comprising means to anchor said sheeting along said stanchions, and wherein

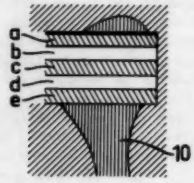
said sheeting extends substantially along the length of said stanchions, so that said sheeting moves together with the stanchions, whereby as said body of water rises, said stanchions together with the sheeting move upward to form a barrier.

4,377,353

METHOD OF SELECTIVE UNDERGROUND MINING AND STABILIZATION OF ROCK CAVITIES

Gustav Hoberstorfer, Järfälla, and Torsten Noren, Täby, both of Sweden, assignors to Gränges AB, Stockholm, Sweden

PCT No. PCT/SE79/00162, § 371 Date Apr. 1, 1980, § 102(e) Date Apr. 1, 1980, PCT Pub. No. WO80/00361, PCT Pub. Date Mar. 6, 1980
PCT Filed Jul. 27, 1979, Ser. No. 190,851
Claims priority, application Sweden, Aug. 3, 1978, 7808366
Int. Cl.³ E02D 19/14; E21C 41/00
U.S. Cl. 405—130 16 Claims



1. A method of underground mining of mineral-bearing rock or of preparation of rock cavities, in which hollow spaces resulting from the mining or preparation of rock cavities at least partially can be refilled at least temporarily with stabilizing ice, and in which the resulting hollow space is prepared for ice filling by treating walls of the hollow space with respect to the geothermic heat content of the surrounding rock, and in which water is supplied to the hollow space while being cooled and frozen by air, and in which the ice body formed is maintained, the improvement comprising preparing the resulting hollow space in a first step for a predetermined time for ice filling by removing a portion of the geothermic heat content in the walls of the hollow space such that the walls assume a temperature below 0° C., and in a second step supplying the water intermittently to form layers in the hollow space, cooling and freezing the supplied water, in a third step removing the constantly inflowing geothermic energy for a predetermined period for maintaining the frozen ice body, said cooling and freezing in all three steps being carried out with artifically cooled air which flows within a closed system entirely separated from normal ventilation air.

4,377,354

FLOW LINE BUNDLE AND METHOD OF TOWING SAME

Arthur W. Morton, Houston, Tex., assignor to Conoco Inc., Ponca City, Okla.

Division of Ser. No. 48,316, Jun. 14, 1979. This application May 26, 1981, Ser. No. 267,180
Int. Cl.³ F16L 1/04
U.S. Cl. 405—171 5 Claims

1. A flow line bundle apparatus for installation between first and second points within a body of water, comprising:

a tubular covering member;

a plurality of conduits disposed within said tubular covering member, for conducting fluids between said first and second points;

sealing means for sealing first and second ends of said tubular covering member to prevent water from entering said conduits and tubular covering, when said flow line bundle is submerged in said body of water;

connecting means for connecting ends of each of said conduits to first and second fluid connectors of said first and second points, respectively; and

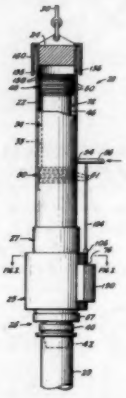
flooding means for flooding a space between said conduits and said tubular covering member.

4,377,355

QUIET BOUNCER DRIVER THRUSTER METHOD WITH PRESSURIZED AIR CHAMBER ENCIRCLING MASSIVE BOUNCING PISTON

Stephen V. Chelminski, West Redding, Conn., assignor to Bolt Technology Corporation, Norwalk, Conn.

Filed Jul. 31, 1979, Ser. No. 62,420
Int. Cl.³ E02D 7/10
U.S. Cl. 405—232 24 Claims



1. In the method of driving a pile into the earth wherein a heavy piston weight moves down and bounces up in a cylinder by cyclically bouncing upon a cushion of pressurized gas trapped in a region below the descending piston weight and above a bottom assembly which is coupled to the pile being driven and additional pressurized gas is injected into said region during each cycle of operation as the piston weight is descending within the cylinder for replenishing the cushion of pressurized gas to be trapped below the descending piston weight for causing the piston weight to bounce thereon, and expanded gas is released from the cylinder beneath the piston weight into the atmosphere during each cycle of operation as the piston weight is moving upwardly in the cylinder, and wherein the downward thrusts of the bouncing piston weight on the cushion of trapped pressurized gas are utilized for driving the pile, the further invention comprising the steps of:

carrying a supply of pressurized gas with the moving piston weight,

said supply being movable and moving down and up along with said piston weight,

continuously feeding pressurized gas from an outside source into said moving supply as the piston weight continues to move down and up in said cylinder,

suddenly placing said moving supply of pressurized gas into communication with the region beneath said piston weight and above said bottom assembly during each cycle of operation as the piston weight is descending near the

bottom of its stroke for suddenly injecting pressurized gas into said region for replenishing the cushion of pressurized gas to be trapped below the descending piston weight and thereafter blocking the flow of pressurized gas to said region by the piston weight as the piston weight further descends for causing the piston weight to bounce on said trapped gas for further compressing said gas with great pressure multiplication without said piston weight striking said bottom assembly, for providing a quiet but very powerful driving action, and

also suddenly placing said moving supply of pressurized gas into communication with the region beneath said piston weight during each cycle of operation as the piston weight is moving upwardly, after bouncing upon said cushion of pressurized gas, for injecting additional pressurized gas beneath the ascending piston weight for boosting it up relatively high in the cylinder in readiness for providing a quiet but very powerful driving action during the next bouncing cycle.

4,377,356

METHOD AND APPARATUS FOR MOVING COAL INCLUDING ONE OR MORE INTERMEDIATE PERIODS OF STORAGE

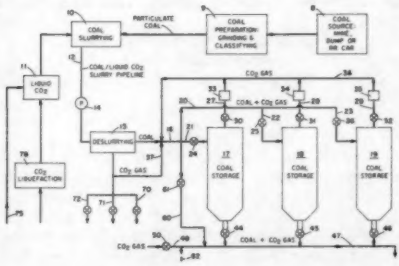
Chakra J. Santhanam, Lexington, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Filed Nov. 21, 1980, Ser. No. 209,127

The portion of the term of this patent subsequent to Jun. 10, 1997, has been disclaimed.

Int. Cl.³ B65G *53/30, 53/16*

U.S. Cl. 406—109 **43 Claims**



1. A method of transporting coal including one or more intermediate periods of storage, comprising the steps of

(a) providing coal in finely divided particulate form;

(b) storing said finely divided coal in a storage space under a protective blanket of gaseous carbon dioxide;

(c) introducing said coal into said storage space by pneumatically pumping it with gaseous carbon dioxide; and

(d) slurrying said coal with liquid carbon dioxide;

(e) pumping the coal/liquid carbon dioxide slurry of step (d) to the vicinity of said storage space before said introducing of said coal into said storage space; and

(f) deslurrying said coal from the coal/liquid carbon dioxide slurry comprising reducing the pressure on said slurry to that level at which essentially all of said liquid carbon dioxide is vaporized out of said slurry and, while reducing the pressure, introducing into said slurry sufficient heat to replace that lost by reducing said pressure on said slurry and prevent the formation of any appreciable quantity of solid carbon dioxide.

4,377,357

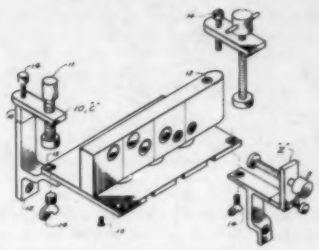
DOWELING JIG

Anthony W. Butera, 112 Tuthill St., Port Jefferson, N.Y. 11777

Continuation-in-part of Ser. No. 96,753, Nov. 23, 1979, abandoned. This application Oct. 28, 1981, Ser. No. 316,091

Int. Cl.³ B23B *47/28, 49/00, 49/02*

U.S. Cl. 408—115 R **11 Claims**



1. A "T" shaped doweling jig comprising a substantially rectangular base plate having a top face with two parallel side edges, at least one alignment port hole formed through said top face, said alignment port hole having sides which taper in ramp-like configuration from a predetermined larger opening to a predetermined smaller opening, at least one ramp-like tapered cut-out formed in each of said side edges, at least one straight port hole girth line extending across said top face from one of said cut-outs to another of said cut-outs, said girth line bisecting said alignment port hole, a substantially rectangular drill bit guide hole member having a top surface with two parallel side edges with a thickness less than said predetermined smaller opening, at least one defined drill bit guide hole extending transversely through said guide hole member, at least one straight guide girth line extending transversely across said top surface from edge to edge, said guide hole girth line bisecting said guide hole, means for attaching said guide hole member to said base plate, said guide hole member being centrally and perpendicularly attached to said base plate to form said "T" shaped doweling jig and intersect said alignment port hole, convertible clamp means for clamping said doweling jig to a workpiece, means for removably attaching said clamp means to said doweling jig, said clamping means comprising a substantially rectangular clamp base portion having two ends, a threaded bore formed through one of said ends, a clamp screw threadably engaged in said threaded bore, a substantially rectangular frame portion, a substantially rectangular frame extension portion attached perpendiculary to said frame portion, a substantially rectangular axial frame extension portion, means for removable attaching said frame extension portion axially to the other end of said frame portion, means for rotatably attaching said frame portion to the other end of said clamp base portion whereby said clamp means can be selectively converted from a "C" configuration to a "Z" clamp configuration by rotating said frame portion relative to said clamp base portion.

4,377,358

EXPANSION FASTNER

Burnell J. Wollar, Barrington, Ill., assignor to Phillips Plastics Corp., Phillips, Wis.

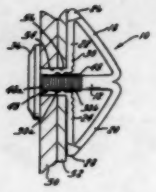
Filed Dec. 29, 1980, Ser. No. 220,908

Int. Cl.³ F16B *13/04*

U.S. Cl. 411—15 **5 Claims**

1. A one-piece, plastic fastener for lockable engagement in an opening in a panel, said fastener comprising a stem having an inner end and an outer end, a pair of legs formed integrally with and extending from said inner end in parallelism with one another and in general axial alignment with said stem, each of said legs having an elongated arm integrally formed therewith

at a juncture, said arm positioned at an acute angle relative to its leg, said arms each having a free end which terminates in an integrally formed head portion, said head portions being cooperatively engageable with one another along a plurality of bevelled edges, said bevelled edges oriented in a non-radial manner along said head portions, said head portions being



swingable about said juncture and with their respective arm towards one another to form a complete head having an orifice embracing said stem, said stem and arms being drivable into said opening in said panel to locate said head against an outer side of said panel, and serration means between said head and said stem to maintain said fastener in said lockable engagement with said panel.

4,377,359

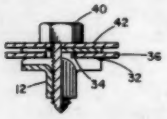
QUARTER-TURN NUT

Francis C. Peterson, St. Charles, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Dec. 12, 1980, Ser. No. 215,773

Int. Cl.³ F16B *39/28*

U.S. Cl. 411—112 **8 Claims**



1. A quarter-turn nut for blind-bore insertion into an elongated, generally rectangular aperture in a thin panel, said nut comprising a central, axially extending, internally threaded shank; a pair of flanges each having an inner edge and an outer edge and being interconnected to a first end of the shank by means connected to the inner edge of the flange, the second shank end constituting a free end, said flanges extending laterally outwardly from said shank in first and second generally opposite directions, the outer edge of each flange being in a different axial plane from the inner edge, such that the outer edge will engage the panel first during insertion to create a spring load when assembled to the panel; a pair of beam members extending outwardly from said shank in third and fourth generally opposite directions, said third and fourth directions being generally perpendicular to said first and second directions, the outer end of each beam member being axially nearer the flanges than the inner end, such that when the beam members are inserted through the aperture in the panel and forced downwardly against the spring load of the flanges and the nut rotated ninety degrees thereby deflecting the beam members to positions underlying the panel, the spring-loaded flanges engaging the upper surface of the panel and the deflected beam members engaging the lower surface of the panel cooperate to frictionally resist axial and rotational displacement of the nut.

4,377,360

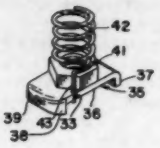
CHANNEL NUT AND METHOD OF MAKING SAME

Edward S. Kennedy, Strongsville, Ohio, assignor to Wire Products Company, Inc., Cleveland, Ohio

Filed May 5, 1980, Ser. No. 146,519

Int. Cl.³ F16B *37/04*

U.S. Cl. 411—116 **3 Claims**



1. A channel nut for space framing systems characterized by a pair of outwardly and downwardly extending arms, a machine nut and a resilient spring projecting upwardly from said channel nut, said channel nut comprising:

(a) a saddle member of thin stock having a pair of arms extending downwardly from each end and forming the saddle;

(b) the saddle member having an opening centrally located therein;

(c) a machine nut fixedly attached to said saddle with the threaded opening in said nut positioned over said saddle opening;

(d) a resilient spring being fastened to said saddle; and

(e) the machine nut being hexagonal in shape with its long axis extending near the downwardly extending arms to strengthen the saddle.

4,377,361

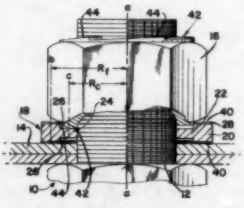
REVERSIBLE LOCK WASHER

Bengt O. Frieberg, La Habra Heights, 869 Picacho, Calif. 90631

Filed Aug. 22, 1980, Ser. No. 180,411

Int. Cl.³ F16B *39/24*

U.S. Cl. 411—161 **6 Claims**



1. A reversible lock washer in combination with a threaded fastener having at least one matching cam surface, said lock washer comprising:

an annular washer body having an outer peripheral ring member and an inner peripheral ring member, said inner ring member defining a central opening in said washer body;

said washer body being formed having oppositely arranged engaging surfaces;

each engaging surface including oppositely disposed inner annular recesses, the width of each of said recesses being less that the total width of said washer body, thereby defining said inner and outer peripheral ring members;

cam means formed on each opposite side of said inner ring member for matching engagement with said cam surface of said fastener;

wherein said cam means of said washer comprises a plurality

of contiguously arranged cam members formed on said opposite sides of said inner ring member and disposed in said respective recesses, the height of said cam members being equal to or less than the depth of said recesses;

said fastener comprising a nut having at least one cam surface formed thereon and positioned to engage said recessed cam members of said washer body, said recessed cam members being arranged in a counter-clockwise direction when faced to engage said opposing cam surface of said nut; and

frictional means formed on each opposite side of said outer ring member, whereby the axial force applied by said fastener is transmitted from said inner ring member to said outer ring member, thereby establishing an outwardly extended moment arm.

6. A reversible lock washer in combination with a threaded fastener having at least one matching cam surface, said lock washer comprising:

an annular washer body having an outer peripheral ring member and an inner peripheral ring member, said inner ring member defining a central opening in said washer body;

said washer body being formed having oppositely arranged engaging surfaces;

each engaging surface including oppositely disposed inner annular recesses, the width of each of said recesses being less than the total width of said washer body, thereby defining said inner and outer peripheral ring members;

cam means formed on each opposite side of said inner ring member for matching engagement with said cam surface of said fastener;

wherein said cam means of said washer comprising a plurality of contiguously arranged cam members formed on said opposite sides of said inner ring member and disposed in said respective recesses, the height of said cam members being equal to or less than the depth of said recesses;

said fastener comprising a screw having a head member, said head member including a cam surface for matching engagement with said recessed cam members of said washer body, said recessed cam member being arranged in a counter-clockwise direction when faced to engage said opposing cam surface of said screw-head member; and

frictional means formed on each opposite side of said outer ring member, whereby the axial force applied by said fastener is transmitted from said inner ring member to said outer ring member, thereby establishing an outwardly extended moment arm.

4,377,362

DEVICE FOR BUNDLING FIREWOOD

Herman E. Meinke, Rte. 3, Boswell, Okla. 74003

Filed Jan. 19, 1981, Ser. No. 226,031
Int. Cl.³ B65G *57/18*
U.S. Cl. 414—43 **3 Claims**

1. Apparatus for bundling short lengths of generally cylindrical elements, such as firewood, comprising:

a horizontal frame portion adapted to rest on the earth;

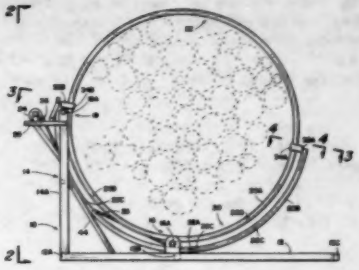
a vertical frame portion extending upwardly from one end of said horizontal portion;

a first low elevational bearing support means affixed to said horizontal portion intermediate the length thereof;

a second bearing support means affixed to said vertical portion adjacent the upper end thereof;

a semi-circular bottom rack supported by said first and second bearing support means, the bottom rack being rotatable about its horizontal axis and normally retained in an upper open position;

a semi-circular top rack of internal dimension substantially equal to said bottom rack and removably attachable to said bottom rack in a common plane to form a circular area in which short length generally cylindrical elements such as firewood may be stacked and retained for receiving a band therearound;



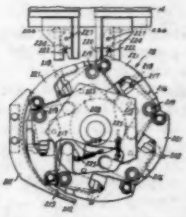
and means for rotating said bottom rack about its horizontal axis whereby banded cylindrical items can be easily removed from the bottom rack.

4,377,363

STACKING MECHANISM

Richard A. Patterson, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 41,629, May 23, 1979, Pat. No. 4,256,528.
This application Oct. 27, 1980, Ser. No. 201,046
Int. Cl.³ B65G *57/30*
U.S. Cl. 414—93 **1 Claim**



1. A mechanism for transporting disk-like objects from holders moving seriatim along a path in which holders the disk-like objects are releasably supported to the bottom of a stack of such disk-like objects, said mechanism comprising:

a shoe fixed along said path, said shoe having a pointed end portion with an arcuate surface along one side and being positioned so that the pointed end portion will separate the disk-like objects from the holders with the disk-like objects disposed along said arcuate surface;

a wheel rotatably mounted adjacent said shoe, said wheel having a support member adapted to support a said disk-like member;

a hook adapted to engage the edge of a said disk-like member, said hook being mounted at one edge of said support member for movement between an engage position at which said hook can engage the edge of a said disk-like member in one of said holders, and a disengaged position spaced from the edge of a said disk-like member supported on said support member;

means for positioning said hook in its engage position and for driving said wheel in synchronism with said holders to engage said hook with said disk-like member in one of said holders and slide said engaged disk-like member along said arcuate surface adjacent said support member;

means adapted for releasably holding said disk-like member slid along said arcuate surface against said support member;

a stop fixed adjacent said wheel and adapted to engage the leading edge of said disk-like member held on said support member with the disk-like member aligned with said stack;

means for moving said hook to its disengaged position with respect to said disk-like member held against said support member prior to engagement thereof with said stop; and

cam means carried by said wheel for moving a said disk-like member stopped against said stop into said stack.

4,377,364

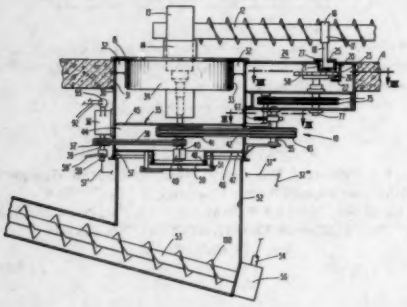
SILO UNLOADING APPARATUS

Richard L. Weaver, R.D. 4, Myerstown, Pa. 17067

Filed Sep. 26, 1980, Ser. No. 191,071

Int. Cl.³ B65G *65/46*

U.S. Cl. 414—307 **7 Claims**



1. In a silo unloader of the bottom unloader type having an unloading auger generally radially disposed at the bottom of the silo and mounted for rotation on its own substantially horizontal axis and for intermittent arcuate sweeping movement across the floor of the silo by means of a drive band located in the floor of a silo, the improvement comprising a generally vertical central drive shaft disposed at the center of the silo beneath the floor thereof and operationally connected to the auger for rotationally driving the auger on its own axis, motor type drive means for driving said shaft and located in the vicinity of the center of the silo near said shaft, and rotationally driven auger advance drive means mechanically connected to said shaft for receiving its driven rotation from said shaft and operationally connected to said drive band for driving said band and consequently driving the auger mounted thereon, in a uniform intermittent sweeping motion across the silo floor.

4,377,365

PIPELINE PADDING MACHINE AND METHOD

Ricky L. Layh, P.O. Box 2271, Hobbs, N. Mex. 88240

Filed Oct. 27, 1980, Ser. No. 200,991

Int. Cl.³ E02F *5/22;* **B60P** *1/36*

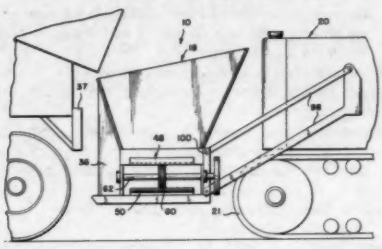
U.S. Cl. 414—334 **15 Claims**

1. A machine for transferring padding material from a transport vehicle into a pipeline ditch, comprising:

an elongated upwardly opening trough for receiving padding material from the transport vehicle; an outlet formed at one end of the trough; a primary vehicle; means mounting said trough to said primary vehicle such that as the primary vehicle travels parallel to a pipeline ditch, the trough is laterally positioned respective to the ditch and is moved parallel to the ditch;

a plurality of chain links forming an endless conveyor chain, said trough includes upwardly directed sidewalls arranged parallel to the conveyor chain; manipulating means by which said trough is positioned respective to said primary vehicle; a bumper means located on a forwardly located trough wall in opposition to said manipulating means by which said trough can be lifted and transported by the manipulating means, while the bumper means can push a transport vehicle which is concurrently dumping padding material into the trough;

journal means at opposed ends of the trough by which said conveyor chain is supported for parallel movement respective to said trough; spaced flappers attached at spaced locations along the endless conveyor chain for supporting padding material thereon, and for moving the padding material towards one end of the trough;



said flappers have opposed sides, a forward edge, and a trailing edge spaced from said forward edge, means attaching the forward edge of said flappers to the chain with the flappers forming a substantially continuous trough bottom;

so that the padding material dumped into the trough by said transport vehicle is supported by the flappers and is conveyed toward the trough outlet where the padding material is directed into the pipeline ditch.

4,377,366

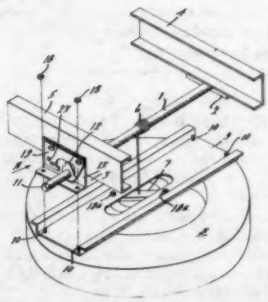
SPARE WHEEL CARRIER FOR A MOTOR VEHICLE

Nigel C. Hamlyn, Plymouth, England, assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 21, 1981, Ser. No. 226,957

Int. Cl.³ B62D *43/00*

U.S. Cl. 414—466 **1 Claim**



1. A spare wheel carrier for a motor vehicle comprising a spindle adapted to be rotatably mounted on a vehicle frame, a cable wound around the spindle and adapted at its free end to be secured to a vehicle wheel, and a releasable ratchet for normally preventing the spindle from rotating in a direction in which the cable would unwind therefrom, characterized in that the releasable ratchet comprises an escapement movable between first and second engaged positions to permit rotation of the spindle in the said direction in incremental steps, the escapement including a ratchet rotatable with the spindle and an anchor having two stop surfaces, each of which engages a

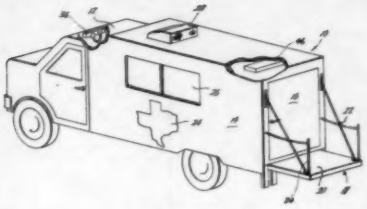
tooth of the ratchet wheel when the other is disengaged therefrom, the anchor defining an orifice which overlies an orifice defined in a backing plate relative to which the anchor is movable, whereby movement of the anchor may be effected by means of a lever engaged in the two orifices.

4,377,367

MOBILE VOTING SERVICE

Oscar W. Smith, 2716 Sweetgum, Pasadena, Tex. 77502

Filed Apr. 3, 1980, Ser. No. 36,875
Int. Cl.³ B60P *1/44, 3/00*
U.S. Cl. 414—545 **15 Claims**



1. A mobile voting vehicle to take the polls to the voters, comprising:

a mobile van having a cab and a body, said body having a door in the side for the entrance and exit of voters;

four voting booths secured inside said body adapted to permit voters to vote for the candidate of their choice, each of said voting booths occupying approximately 36 square feet of floor space in said body;

a two-way communication system disposed with said cab having a communication range of at least 45 miles;

a desk and two chairs disposed within said body for the registration of the voters;

a safe secured inside said body for securing ballot data; and

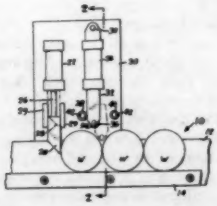
a hydraulic lift adjacent said door for raising and lowering said voting booths and handicapped voters to and from said body, said lift including a platform, at least one hydraulic support extending from said platform to said body, and hydraulic controls for operating said hydraulic support to raise and lower said platform with respect to said body.

4,377,368

ESCAPEMENT MECHANISM

Richard L. Koch, Warren, Mich., assignor to F. Jos. Lamb Company, Warren, Mich.

Filed Dec. 10, 1980, Ser. No. 215,093
Int. Cl.³ B65G *47/26*
U.S. Cl. 414—748 **8 Claims**



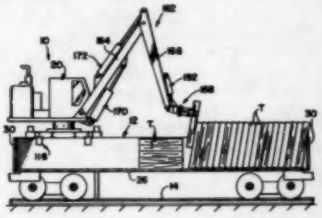
1. A metering device for workpieces comprising a downwardly inclined track along which a series of workpieces are adapted to gravitate in succession, the workpieces having a configuration such that, when they are arranged in a row in abutting relation on the track, a cleavage cavity is formed between the successive workpieces which opens in a direction transversely of the track, a stop positioned to engage and arrest the downward movement of the leading workpiece in the track, said stop being retractable to release the leading workpiece and thus permit it to advance downwardly on the track from its arrested position, a second retractable stop spaced upstream on the track from the first stop and positioned so that when extended it projects in a direction transversely of the track into the cleavage cavity between a pair of successive abutting workpieces on the track, said second stop being gravitationally supported on a pivot axis so that it swings freely in a direction generally lengthwise of the track, abutment means for limiting gravitational pivotal movement of the second stop in a downstream direction on the track to arrest movement of the upstream workpiece of said pair when the first stop is retracted and the second stop is extended, said second stop being axially retractable from said cleavage cavity in a direction toward its pivot axis for releasing said upstream workpiece and means for extending and retracting said stops alternately, said abutment means being located so that, when the pivoted stop is engaged therewith in the extended position, it projects in said cleavage cavity and the upstream workpiece of said pair is arrested at a position upstream of its position when arrested by the first stop.

4,377,369

APPARATUS FOR LOADING AND UNLOADING RAILWAY CARS

Ted C. Johnson, Jr., 33829 Country View La., Chagrin Valley Estates, Solon, Ohio 44139

Division of Ser. No. 124,838, Feb. 26, 1980. This application Apr. 6, 1981, Ser. No. 251,385
Int. Cl.³ B65G *57/18*
U.S. Cl. 444—786 **6 Claims**



1. A method of loading railway ties in an open top railway car having a bottom wall, side walls and end walls comprising, positioning a layer of ties horizontally on said bottom wall between said side walls and generally centrally between said end walls of said car, and progressively loading additional ties into said car from one end thereof toward the other with the long dimension of said additional ties extending upwardly with respect to said bottom wall and with said additional ties adjacent the end wall at said one end of said car leaning against the latter said end wall.

4,377,370

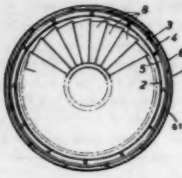
SAFETY DEVICE FOR A ROTATING ELEMENT OF A TURBINE ENGINE

Gerard Porcelli, Yerres, France, assignor to Societe Nationale d'etude et de Construction de Moteurs d'Aviation, "S.N.E.C.-M.A.", Paris, France

Filed Oct. 16, 1980, Ser. No. 197,601
Claims priority, application France, Oct. 19, 1979, 79 25972
Int. Cl.³ F01B *25/16*; F01D *21/00*
U.S. Cl. 415—9 **9 Claims**

1. Safety device for a rotating element of a turbine engine located in the casing of an engine and having rotating blades,

comprising a ring surrounding a stage of blades, upon which is wound an elongated element, said ring being capable of being traversed by a fragment of a ruptured blade or a blade that has been detached and which strikes the elongated element, and wherein the windings of said elongated element move to ab-

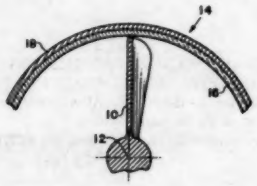


sorb the kinetic energy, the improvement comprising: starting from the innermost layer an internal envelope, a first ring of segments made of a deformable material, a winding of an elongated element encased in a polymerizable material, a second ring of segments made of a deformable material and a thin external envelope.

4,377,371
LASER SURFACE FUSION OF PLASMA SPRAYED CERAMIC TURBINE SEALS

Donald W. Wisander, Columbia Station, and Robert C. Bill, Rocky River, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 11, 1981, Ser. No. 242,795
Int. Cl.³ F01D *11/08*
U.S. Cl. 415—174 **8 Claims**



1. In a gas path seal for a turbine or the like having a plurality of blades mounted for rotation about an axis, an improved shroud surrounding the tips of said blades in substantially concentric relationship to said axis, said shroud comprising

an annular substrate spaced from the tips of said blades,

a coating of zirconia that is abradable relative to said blades and closely spaced to said blade tips covering said annular substrate whereby said zirconia abrades when said blades rub against said coating, and

a fused layer of zirconia at the surface of the coating adjacent to said blade tips, said fused layer having a network of very fine microcracks for precluding the formation of a catastrophic crack during thermal shock exposure.

4,377,372
WIND TURBINE

Carl Stutzman, 9581 Parade St., Anaheim, Calif. 92804

Filed Nov. 9, 1981, Ser. No. 319,243
Int. Cl.³ F03D *3/06*
U.S. Cl. 416—117 **2 Claims**

1. A wind turbine vane system comprising:

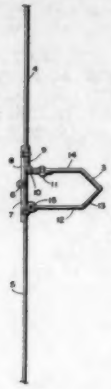
(a) A first and a second vane;

(b) A thrust bar;

(c) A first hinge communicating with said thrust bar and with said first vane;

(d) A second hinge communicating with said first vane and with said second vane;

(e) Means to connect said first hinge to said thrust bar and to said first vane;



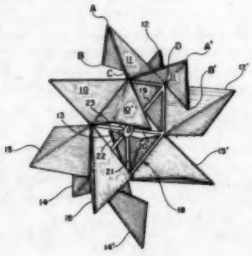
(f) Means to connect said second hinge to said first vane and to said second vane;

(g) Said above elements arranged such that said vanes may be opened and closed by gravity and wind forces.

4,377,373
WINDMILL

Robert Westerhausen, Milwaukee, Wis., assignor to Wonder Wind Enterprises, Inc., Milwaukee, Wis.

Filed Sep. 28, 1981, Ser. No. 306,284
Int. Cl.³ F03D *3/06*
U.S. Cl. 416—197 A **4 Claims**



1. A windmill blade system comprising in combination:

(1) a first blade unit having:

(a) a planar center area and a center mounting orifice; and

(b) a series of projections extending equidistantly from said center point and from each other around the periphery of the center area each of said projections consisting of an upper and a lower triangle, each having an inner and an outer face and sharing a common base, the outward faces of each of said triangles being above the plane of the center area and the inward faces of said triangles defining an angle not greater than 90° as measured from a point on the common base line with each of said projections being essentially equal in size and configuration; and

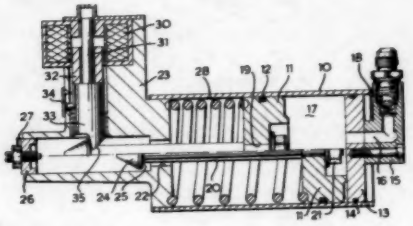
(2) a second blade unit having a center area equal in outer configuration and having projections identical to said first blade unit positioned adjacent to and inverse with said

first base unit with each of the pairs of triangles on said second blade unit positioned below the plane of the center area of said second unit, said projections of said second blade unit forming a mirror image of said projection of said first blade unit when viewed on a plane extending from said center areas of said adjacent blade unit.

4,377,374
SPRING ACTUATED PISTON PUMP

Frederick J. Taylor, 41 Victory Rd., West Mersea, Essex, England

Filed May 4, 1981, Ser. No. 260,217
Claims priority, application United Kingdom, Feb. 17, 1981, 8104983
Int. Cl.³ F01M 1/16
U.S. Cl. 417—228 11 Claims



1. A pump comprising a pump cylinder, a cylinder head mounted on one end of the pump cylinder, a piston slidably mounted within said pump cylinder for movement between a first position adjacent said cylinder head and a second position spaced from said cylinder head, said piston having a piston crown facing said cylinder head thereby defining in conjunction with said pump cylinder and said cylinder head a pump chamber, the cylinder head being provided with two apertures respectively to allow the ingress of liquid to and ejection of liquid from said pump chamber on movement of said piston, there being spring biassing means acting on said piston to urge said piston towards said cylinder head, a piston rod mounted on said piston and extending axially thereof away from said cylinder head, an abutment provided on said piston rod and a catch member movably mounted on said pump cylinder so as to be co-operable with said abutment when said piston is at a third position part-way between said first position and said second position, to restrain movement of the piston towards said first position under the action of said spring biassing means, a solenoid being provided on said pump cylinder to effect movement of said catch member thereby to release said piston when said solenoid is energised.

4,377,375
APPARATUS FOR FORMING ALLOY POWDERS THROUGH SOLID PARTICLE QUENCHING

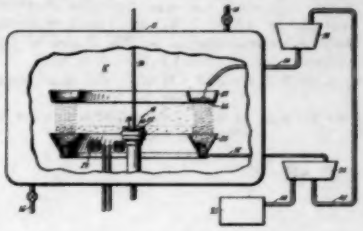
Edward R. Slaughter, Palm Beach Shores, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 239,231, Mar. 2, 1981, Pat. No. 4,355,057.
This application Jan. 15, 1982, Ser. No. 339,810
Int. Cl.³ B28B 1/54
U.S. Cl. 425—8 1 Claim

1. An apparatus for forming particles substantially of rapidly quenched metallic material, comprising:

means for generating a stream of droplets of molten metallic material of the composition desired of the particles to be formed, including a rotatable disk onto which molten material is flowable such that droplets of said molten material are sheared from the rim of the disk upon rotation to form a radially emanating stream of molten droplets;

means for dispensing particles of solid material across the stream of molten droplets to intercept said molten droplets and cause said molten droplets to be deposited and rapidly quenched on the particles of solid material, including a donut shaped hopper having apertures therein from which



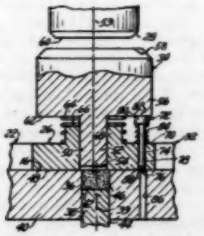
the solid particles are dispensable in an annular pattern across the path of the molten droplet stream, and

means for collecting said particles of solid material after said particles have traversed the stream of molten droplets.

4,377,376
INDEXING MECHANISM FOR THE ANVIL ASSEMBLY OF A POWDER-COMPACTING PRESS

Raymond P. De Santis, Troy, Mich., assignor to PTX-Pentronix, Inc., Lincoln Park, Mich.

Filed Sep. 24, 1981, Ser. No. 305,127
Int. Cl.³ B30B 11/02
U.S. Cl. 425—78 8 Claims



1. A locating and positioning mechanism for a powder compacting apparatus having an anvil positionable away from a die cavity and above said die cavity for compacting powder material disposed in said die cavity against said anvil, said positioning and locating mechanism comprising a positioner effecting coarse positioning of said anvil over said die cavity and a fine positioner effecting precise positioning of said anvil over said die cavity, said fine positioner comprising a bore in said die plate, a plunger disposed in said anvil, said plunger having an end normally retracted and engageable in said bore, and means for displacing said plunger in the direction causing the end of said plunger to project into said bore.

4,377,377

DIFFERENTIAL PRESSURE FORMING MACHINE WITH VARIABLE MOLD CLOSED CYCLE

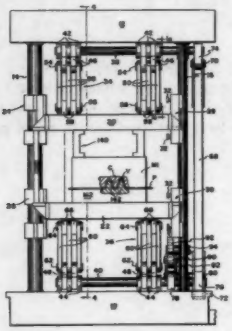
Albert W. Arends, Gladwin; George L. Pickard, Beaverton; George A. West, Clare, and Edward J. Russell, Gladwin, all of Mich., assignors to Leesona Corporation, Warwick, R.I.

Continuation of Ser. No. 117,458, Feb. 1, 1980, abandoned, which is a continuation of Ser. No. 38,384, May 14, 1979, abandoned, which is a continuation-in-part of Ser. No. 904,587, May 10, 1978, Pat. No. 4,158,539. This application Dec. 15, 1980, Ser. No. 216,317

The portion of the term of this patent subsequent to Jun. 19, 1996, has been disclaimed.

Int. Cl.³ B29C *17/00*

U.S. Cl. 425—155 **30 Claims**



1. In a thermoforming machine having a frame; a pair of mold carrying platens mounted on said frame for movement toward and away from each other between a mold open and a mold closed position, and motor driven means including cam and cam follower means operable when driven to cyclically drive said platens between said mold open and mold closed position, the improvement wherein said motor driven cam and cam follower means comprises a cam for each platen mounted on said frame for rotation about an axis, each cam having a dwell portion of given angular extent lying at a constant radius from the axis about which it rotates, said follower means including a cam follower for each platen engaged with each cam and operable to maintain the mold platen it drives in mold closed position when the cam follower is engaged with the dwell portion of its cam, variable speed motor means for driving said cams in rotation, and control means for selectively controlling the speed of said motor means during that portion of the rotary cycle of said cams when said cam followers are engaged with said dwell portions to thereby adjustably vary the times during which said mold platens are held in said mold closed position.

4,377,378

LIGHTER MECHANISM

Peter G. S. Low, BM Magister, London WC1N 3XX, England

Filed Jun. 30, 1980, Ser. No. 163,993

Int. Cl.³ F23Q *2/08*

U.S. Cl. 431—140 **15 Claims**

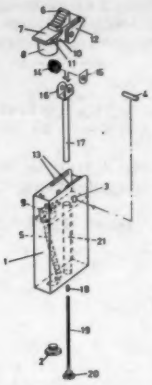
1. A lighter having a body which houses:

(a) a rotatable flint wheel;

(b) a resilient means which can bear against said flint wheel;

(c) a lid assembly for the fuel outlet of the lighter, having a cam and being mounted coaxially with said flint wheel and connected to said flint wheel via a ratchet mechanism such that opening movement of said lid assembly also rotates said flint wheel; and

(d) a cam guide against which said cam abuts; said cam being shaped such that pivoting of said lid assembly from a closed position to an open position causes the axis of rotation of said flint wheel to be moved in opposition to the force exerted by said resilient means thus causing said



lid assembly to be biased towards a closed position when in the closed position.

4,377,379

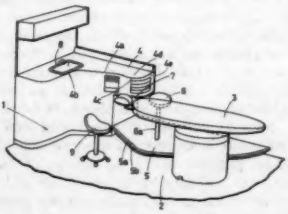
DENTAL TREATMENT ROOM

Sachiko Kawaguchi, 205-Go, 2-4-26, Kohama, Suminoe-ku, Osaka, Japan

Filed Sep. 10, 1981, Ser. No. 300,811

Int. Cl.³ A61G *15/00*

U.S. Cl. 433—77 **3 Claims**



1. In a dental treatment room having a floor a cabinet disposed on said floor said cabinet having a front and back, treating seat elevated above said floor for holding a patient and located in said front of said cabinet; the improvement comprising

a platform having a height above said floor of between 10 to 15 cm and located on one side of said treating seat and extending to be adjacent to and against said front of said cabinet,

a horizontally rotatable seat for use by a dental assistant integrally connected to said platform and within a distance accessible by said dental assistant to said cabinet and located on said one side of said treating seat and in said front of said cabinet,

a dentist station disposed on said floor and located on another side of said treating seat and in said front of said cabinet, whereby the dentist and dental assistant have areas of work space which do not interfere with each other.

4,377,380

DUAL PLUNGER DENTAL AMALGAM DISPENSER

Leslie Vadas, 134 Riviera Dr., Los Gatos, Calif. 95030, and Bert M. Sabo, 19200 Bountiful Acres, Saratoga, Calif. 95070

Filed Dec. 15, 1980, Ser. No. 216,146
Int. Cl.³ A61C 5/04
U.S. Cl. 433—99 19 Claims

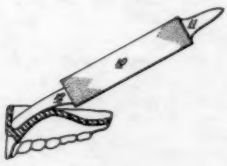
1. A dental amalgam dispensing instrument of the type having a dispensing head, said head comprising an elongate tube mounting an angularly disposed dispensing tip on the front end of said tube for introduction into an oral cavity, said tip being formed with a dispensing passage, a dispensing plunger that slidably fits the passage, an elongate hollow handle for the tube, actuator means for the dispensing plunger, said tube having an amalgam feed passage intersecting the dispensing passage, a feed plunger sliding in said feed passage and means for advancing said feed plunger; the improvement wherein said feed passage lies wholly within said tube, means for detachably mounting the rear end of said tube on said handle, said dispensing passage having an elongate planar rear wall and side walls that intersect said planar rear wall at an angle of about 90 degrees, said feed plunger having a planar front end face that forms a continuation of the planar rear wall of said dispensing passage when the feed plunger is fully advanced, said dispensing plunger having a planar rear surface that is laterally coextensive with said planar rear wall of said dispensing passage so that advance of said dispensing plunger, when the feed plunger is fully advanced, clears the passage intersection of amalgam, a feed plunger stop member projecting into the hollow of said handle, a stop abutment on said feed plunger disposed entirely within the hollow of said handle for engaging said stop member in the handle and for limiting advance of said feed plunger to a position wherein its front end face is flush with the rear wall of said dispensing passage, and a spring in said handle for advancing said feed plunger, said feed plunger being withdrawn from said head by said stop member upon detachment of the head from the handle.

4,377,381

HOME CARE DENTURE CLEANING TOOL

Robert E. Westman, 61 Ninth St. S., Naples, Fla. 33940

Filed Oct. 14, 1981, Ser. No. 311,338
Int. Cl.³ A61C 3/00
U.S. Cl. 433—141 6 Claims



1. A denture cleaning tool for use by denture wearers comprising:

an elongated handle to be held in the hand of a user,

a first generally flat blade secured to one end of the elongated handle for cleaning interproximal spaces and cervical areas of teeth on a denture,

said first blade having a sharp pointed apex and two edges leading to said apex forming an angle of approximately 60° and the two edges leading to said apex being sharpened to a knife edge, and

a second generally flat blade secured to the opposite end of said handle for cleaning flanges and palatal areas on a denture,

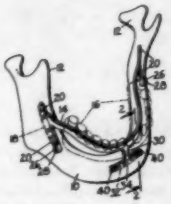
said second blade having a concave convex configuration and a semicircular forward tip, the two edges and tip of said second blade being sharpened to a knife edge.

4,377,382

DENTURE SUPPORT FRAME

Ralph A. Roberts, 920 Rio Dell Ave., Rio Dell, Calif. 95562

Continuation-in-part of Ser. No. 69,592, Aug. 24, 1979. This application Dec. 24, 1980, Ser. No. 220,018
Int. Cl.³ A61C 13/00
U.S. Cl. 433—176 6 Claims



1. A denture support frame arranged to be attached to the horizontal portion of the lower jaw bone as well as to the upwardly directed rear ramus portion thereof, said support frame comprising

(a) a one-piece rigid bar arranged to support an artificial denture thereon,

(b) said bar having front and rear portions and being curved substantially to the longitudinal contour of the lower jaw bone,

(c) said bar having a rear ramus implant portion on each side arranged to be implanted in a recess cut in the jaw bone,

(d) front support means on said bar arranged for engagement with the jaw bone,

(e) each of said ramus implant portions comprising a rear plate-like extension of said bar having laterally facing surfaces and upper and lower ends,

(f) said rear plate-like extension projecting rearwardly and forwardly of the rearward end of said bar to provide an extended implant attachment to jaw bone structure,

(g) and laterally extending tab means on said rearwardly directed plate-like extensions arranged to seat on the jaw bone for further adding to support area for the ramus implant portions.

4,377,383

TEACHING APPARATUS WITH SYSTEM FOR REPETITIVE REVIEW OF INFORMATION

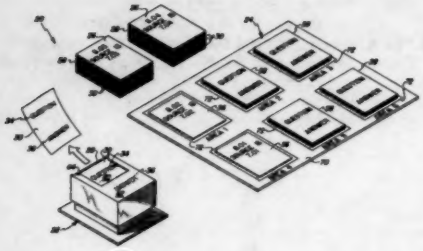
John S. Meyers, Bergenfield, N.J., assignor to Christopher Boettger, Dumont, N.J.

Filed Nov. 17, 1980, Ser. No. 207,367
Int. Cl.³ G09B 3/00
U.S. Cl. 434—348 15 Claims

1. Apparatus for enabling a reviewer to review items of information to be learned by the reviewer in accordance with a prescribed routine of repetitive review of a plurality of information-bearing elements, each element carrying an item of information to be reviewed, the apparatus and routine ensuring a more frequent review of unlearned items as compared to learned items during the course of the routine, said apparatus comprising:

classification means for defining a plurality of grades, the grades being arranged in a given sequence from lower

grades to higher grades and for defining classes within the grades, the number of classes within each grade being greater in the higher grades than in the lower grades; and manipulation means for enabling the review and successive grouping of the elements within groups of prescribed classes and grades in accordance with one of two choices made by the reviewer upon each review of the item of each element, the choices being based upon learned items and unlearned



items, said manipulation means including grouping means for effecting said grouping of the elements in response to each choice so as to determine the frequency of review of the corresponding item subsequent to that choice as the element carrying that item follows the given sequence through the grades and classes to enable a more frequent review of unlearned items as compared to learned items during the course of the routine.

4,377,384

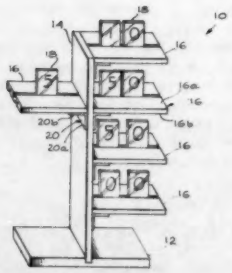
THREE-DIMENSIONAL TEACHING DEVICE

Donald R. Williams, 3467 W. 67th St., Los Angeles, Calif. 90043

Filed May 26, 1981, Ser. No. 266,741

Int. Cl.³ G09B 1/14, 19/02

U.S. Cl. 434—209 **2 Claims**



1. In a three dimensional teaching device, comprising:

(a) a stand, including a base and an upright;

(b) a plurality of horizontally extending surfaced shelves, mounted fixedly to and extending from the left and right hand side, respectively of the upright;

(c) a plurality of slides, respectively impressed with digits for vertical removable mounting on the surfaces of the shelves each of said shelves being capable of carrying more than one slide, in such a manner as to constitute, in combination with the shelves, on which they are mounted, a graphic presentation of a variety of mathematical problems and their solutions.

4,377,385

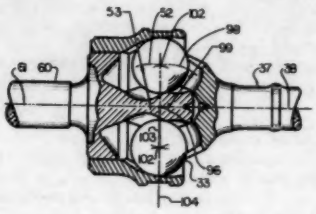
HOMOKINETIC UNIVERSAL JOINT

William F. Sindelar, 8009 York Rd., Towson, Md. 21204

Filed Jan. 8, 1981, Ser. No. 223,282

Int. Cl.³ F16D 3/22

U.S. Cl. 464—142 **11 Claims**



1. A homokinetic joint comprising:

a first joint half, having a first axis of rotation;

a second joint half, having a second axis of rotation;

means to axially restrain the first joint half and the second joint half while allowing angular movement about a point in the first axis of rotation and in the second axis of rotation;

a first set of two axially extending circumferentially opposed grooves formed in the first joint half;

a second set of two axially extending radially opposed grooves formed in the second joint half; and

an intermediate member positioned in the first set of circumferentially opposed grooves and in the second set of radially opposed grooves, occupying both sets simultaneously, to make a torque transmitting connection between said first joint half and said second joint half;

the grooves of said first and second sets are each arranged in conjugate pairs so as to constrain said intermediate member independently of the other of said first and second sets.

4,377,386

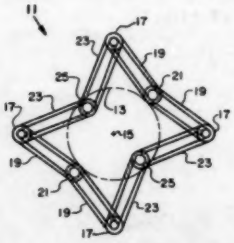
LINK COUPLING

Alan J. Hannibal, Fairview, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Aug. 22, 1980, Ser. No. 180,247

Int. Cl.³ F16D 3/62

U.S. Cl. 464—69 **22 Claims**



1. A link coupling for transmitting rotary motion from a drive member to a driven member about a longitudinal axis generally aligned with the axes of said drive and driven members, said link coupling comprising:

at least two polygonally shaped flexing structures encircling said axis at closely adjacent locations along the length thereof between said drive and driven members, each of said flexing structures including at least eight sequentially arranged link elements and associated end connectors;

connecting means, cooperable with said end connectors, for

joining said flexing structures together to form said coupling and for joining said coupling to said drive and driven members;

said end connectors of each one of said flexing structures including a plurality of outer end connectors symmetrically disposed at an equal radial distance about said longitudinal axis, at least two first inner end connectors each disposed at a first radial distance from said longitudinal axis, and at least two second inner end connectors each disposed at a second radial distance from said longitudinal axis, said first radial distance being greater than said second radial distance and less than said radial distance between said axis and said outer end connectors;

said inner end connectors of each of said flexible structures being arcuately spaced about said axis from each other at approximately equal arc intervals;

said link elements of each of said flexible structures including first link elements disposed between and connecting respective ones of said outer end connectors and said first inner end connectors, and second link elements disposed between and connecting respective ones of said outer end connectors and said second inner end connectors.

4,377,387

DELIMING HIDES

Erwin Hahn, Heidelberg; Dietrich Lach, Friedelsheim; Kurt Schneider, Duerkheim; Rainer Strickler, Heidelberg, and Rolf Streicher, Worms, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 12, 1982, Ser. No. 348,277

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1981, 3108428

Int. Cl.³ C14C *1/08*

U.S. Cl. 8—94.17 4 Claims

1. A process for deliming a conventionally limed hide for from one to six hours under conventional deliming conditions in respect of liquor length, temperature and pH of the liquor, wherein a cyclic carbonate of a polyhydric aliphatic alcohol of 2 to 6 carbon atoms is employed as the active agent.

4,377,388

DEEP IMMERSION SHRINKPROOFING OF WOOL

Frank Mains, Don Mills, Canada, assignor to Kroy Unshrinkable Wools, Limited, Toronto, Canada

Continuation of Ser. No. 905,853, May 15, 1978, abandoned, which is a division of Ser. No. 685,251, May 11, 1976, abandoned. This application Jan. 18, 1980, Ser. No. 113,333

Claims priority, application United Kingdom, May 15, 1975, 20652/75

Int. Cl.³ D06M *3/08, 13/52*

U.S. Cl. 8—128 R 7 Claims

1. A process for shrinkproofing wool sliver comprising: immersing said wool sliver in a direction not greater than 10° from vertical into a bath of shrinkproofing solution to a depth of at least 1 meter, at a rate of immersion into said shrinkproofing solution equal to or less than the rate at which said solution displaces air from the capillaries of said sliver, and thereafter removing said sliver from said solution, said solution being an aqueous hypochlorous acid solution.

4,377,389

DIP DYEING OF PLASTIC ARTICLES AND THE DYE BATH COMPOSITION THEREOF

Theodore A. Haddad; Walter Kondig, both of Leominster, and Richard A. Phillips, Acton, all of Mass., assignors to Foster Grant Corporation, Leominster, Mass.

Continuation-in-part of Ser. No. 102,695, Dec. 12, 1979, Pat. No. 4,245,991. This application Nov. 21, 1980, Ser. No. 209,083

The portion of the term of this patent subsequent to Jan. 20, 1998, has been disclaimed.

Int. Cl.³ D06P *3/00*

U.S. Cl. 8—506 21 Claims

1. A dye bath composition comprising a dye and a mixed solvent, said mixed solvent comprising about 70 to about 100 weight percent of glycerol and ethylene glycol in a relative weight ratio in the range of from about 95:5 to about 20:80.

4,377,390

ACETOACETIC ARYLIDE AZO DYESTUFFS FOR SYNTHETIC MATERIALS, ESPECIALLY POLYESTER

Karl H. Schündehütte, Leverkusen; Henning Reel, Cologne, and Winfried Kruckenberg, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

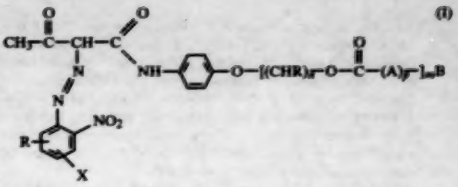
Division of Ser. No. 93,947, Nov. 14, 1979, abandoned. This application May 27, 1981, Ser. No. 267,811

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1978, 2850915

Int. Cl.³ C09B *29/32;* D06P *1/18*

U.S. Cl. 8—671 1 Claim

1. A process for dyeing and printing synthetic fibre materials comprising employing therefor azo disperse dyestuffs of the formula (I)



(I)

wherein

R denotes hydrogen or C_1–C_4-alkyl,

X denotes R, Cl or Br,

m denotes the number 0 or 1,

a denotes a number from 2 to 4,

p denotes the number 0 or 1,

A denotes oxygen or —NR— and

B denotes optionally substituted C_1–C_8-alkyl, alkenyl, cycloalkyl, aralkyl or aryl.

4,377,391

PRODUCTION OF FUEL

Eric C. Cottell, Private Rd., Bayville, N.Y. 11709

Continuation of Ser. No. 915,854, Jun. 15, 1978, abandoned. This application Oct. 6, 1980, Ser. No. 194,117

Int. Cl.³ C10L *1/32, 9/00*

U.S. Cl. 44—51 6 Claims

1. A method of producing fuel comprising forming a slurry consisting of a dispersion of particles of coal and impurities bonded to said coal and water, exposing the slurry to a sufficiently intense vibrating action to produce cavitation within the slurry and to mechanically detach the impurities from said coal and to reduce the size of the particles, mechanically separating detached impurities from the slurry, and partially reducing but not fully separating the water content of the slurry preparatory to the addition of oil to form a coal/oil/water fuel.

2. The method according to claim 1 wherein said agitation is produced by exposing said slurry to a sonic energy density level of at least 3 watts/cm^2.

4,377,392

COAL COMPOSITION

Lester G. Massey, Moreland Hills, Ohio; Robert I. Brabets, Lombard, and William A. Abel, Joliet, both of Ill., assignors to CNG Research Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 261,470, May 7, 1981, Pat. No. 4,364,740, which is a continuation-in-part of PCT/US81/00273, Mar. 4, 1981, WO81/02583, abandoned, which is a continuation-in-part of Ser. No. 127,740, Mar. 6, 1980, Pat. No. 4,313,737

This application Aug. 24, 1981, Ser. No. 295,755

Int. Cl.³ C10L *1/32, 9/08*

U.S. Cl. 44—51 10 Claims

5. A hydrocarbonaceous material derived from coal characterized as being relatively free of mineral components originally present in the coal, and having

(a) a volumetric mean particle size of less than about 5 microns,

(b) a density of about 0.7 to about 0.9 g/cc,

(c) a solubility in a solvent selected from the group consisting of gasoline, benzene, methyl alcohol, carbon tetrachloride and tetralin of about two times to about six times greater than the solubility of the original coal,

(d) a subfraction of discrete hydrocarbonaceous particles substantially free of sulfur having a particle size of less than about 2 microns in diameter and,

(e) an oxidation decomposition rate determined by thermogravimetric analysis in ambient atmosphere which includes a first peak at about 300° C. and a second peak between about 350° and about 450° C., said decomposition rate decreasing to substantially zero between said first peak and said second peak,

(f) said carbonaceous material further comprising the hydrocarbonaceous portion of the explosively comminuted product of a slurry of coal and a liquid initially maintained at a temperature and pressure above the critical temperature and pressure of the liquid and subsequently comminuted by substantially instantaneously reducing the pressure imposed upon the slurry, said hydrocarbonaceous material being substantially scissioned from the mineral matter originally present in the coal.

6. An admixture of the material of claim 5 with a liquid fuel.

4,377,393

PROCESS FOR THE PREPARATION OF A MIXTURE CONSISTING ESSENTIALLY OF ISO-BUTENE OLIGOMERS AND METHYL TERT.-BUTYL ETHER, ITS USE, AND FUELS CONTAINING SUCH MIXTURE

Bernhard Schleppinghoff, Dormagen, Fed. Rep. of Germany, assignor to EC Erdolchemie GmbH, Cologne, Fed. Rep. of Germany

Filed Oct. 27, 1980, Ser. No. 200,700

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1979, 2944457

Int. Cl.³ C10L *1/18*

U.S. Cl. 44—53 **11 Claims**

1. A process for the preparation of a mixture consisting essentially of iso-butene oligomers and methyl tert.-butyl ether, which comprises:

(a) contacting a mixture of straight chain branch butanes and butenes with an acid catalyst whereby to convert 50% to 90% by weight of the isobutenes contained therein and to diisobutylene and triisobutylene;

(b) contacting the reaction mixture thus obtained with at least a molar amount of methanol, relative to any residual isobutene in the presence of an acid catalyst; and

(c) separating off unreacted butanes and butenes from the reaction mixture.

4,377,394

APPARATUS FOR THE PRODUCTION OF CLEANED AND COOLED SYNTHESIS GAS

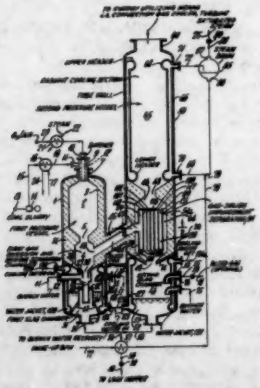
James R. Muenger, Beacon; Edward T. Child, Tarrytown, and Albert Brent, Huntington, all of N.Y., assignors to Texaco Development Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 43,918, May 30, 1979, Pat. No. 4,251,228. This application Jul. 28, 1980, Ser. No. 172,746

The portion of the term of this patent subsequent to Sep. 15, 1998, has been disclaimed.

Int. Cl.³ C10J *3/20*

U.S. Cl. 48—62 R **21 Claims**



1. An apparatus for continuously producing a high pressure stream of cleaned and cooled synthesis gas, reducing gas, or fuel gas comprising: a vertical cylindrical refractory lined pressure vessel containing a reaction zone comprising an unobstructed free-flow vertical cylindrical central passage, a top central inlet and a bottom central outlet; burner means mounted in said top inlet for introducing into said reaction zone reactant streams comprising solid carbonaceous fuel and free oxygen containing gas, with or without a temperature moderator, said solid carbonaceous fuel undergoing a partial oxidation reaction in the reaction zone; a thermally insulated first gas diversion and residue separation chamber with an upper central inlet means connected to the bottom outlet means of said reaction zone by way of a connecting passage, whereby the downflowing hot raw gas stream generated in said reaction zone and containing entrained residue from the partial oxidation reaction passes down through said connecting passage and expands into said first gas diversion and residue separation chamber whose net internal volume is smaller than that of said reaction zone and where the velocity of the hot gas stream is reduced and a portion of said entrained residue is separated; a bottom central outlet means in said first gas diversion and residue separation chamber for discharging said separated portion of residue into a first slag chamber located below; a side outlet in said first gas diversion and residue separation chamber from which exits about 80 to 100 vol. % of the hot raw gas stream less said separated portion of residue; a thermally insulated transfer line with an upstream end connected to the side outlet of said first gas diversion and residue separation chamber, and with the downstream end discharging said hot ga stream from the first gas diversion and residue separation chamber into the inlet means of at least one thermally insulated gas-solids impingement separation means, said gas-solids impingement separation means having inlet and upper outlet means for the hot gas stream and bottom outlet means for the residue separated therein and being located in a second separate vertical pressure vessel wherein changes in the direction and velocity of the hot gas stream take place and additional entrained residue is separated from the hot gas stream, a second slag chamber located in the bottom of said second vessel below the bottom outlet means of said gas-solids impingement separation means for receiving said separated residue; means defining a cylindrical vertical radiant cooling zone with a longitudinal free-flow unobstructed central passage, the lower portion of said radiant cooling zone being in communication with the upper outlet means of said gas-solids impingement separation means whereby hot gas from said gas-solids impingement separation means is passed upward into the bottom of said radiant cooling zone where at least a portion of the residue entrained therein is separated by gravity, said radiant cooling means being located along the inside walls of said second pressure vessel for cooling by indirect heat exchange the hot gas stream from said gas-solids impingement separation means passing upward through the radiant cooling zone, an upper outlet means in said second vessel for discharging cleaned and cooled synthesis gas, reducing gas, or fuel gas from said radiant cooling zone, and a lower outlet for discharging separated residue from said second slag chamber.

4,377,395

PROCESS AND APPARATUS FOR GASSING LIQUIDS

Peter Herbrechtsmeier, Hofheim am Taunus; Hans Schäfer, Bad Soden am Taunus, and Rudolf Steiner, Sulzbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 24, 1981, Ser. No. 247,132

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1980, 3011614

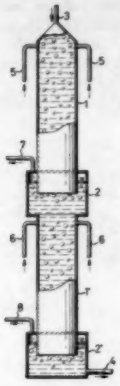
Int. Cl.³ B01F *3/04*; B01D *19/00*

U.S. Cl. 55—38 **9 Claims**

1. A multistep process for contacting a gas with a liquid streaming vertically downward through at least two adjacent superposed stages at a given superficial velocity which comprises introducing a first portion of the gas in the form of bubbles into the liquid stream at the upper end of a first stage

and a second portion of the gas in the form of bubbles into the liquid stream at the upper end of a second stage below and downstream from the first stage, reducing the velocity of the liquid flow at the lower end of each stage to separate non-absorbed gas bubbles from the downwardly streaming liquid at the lower end of each stage, and discharging the non-absorbed gas bubbles.

7. Apparatus for multistep gassing of a stream of liquid



flowing downwardly therethrough which comprises a substantially vertical vessel having at least two superposed stages, each stage having an upper portion of a given cross-sectional area and a lower portion of greater than said given cross-sectional area, said upper portion having an inlet for the stream of liquid and, below said liquid inlet, means for introducing gas in the form of bubbles, and said lower portion having means for discharging non-absorbed bubbles of gas from the liquid stream.

4,377,396

PROCESS OF PURIFYING EXHAUST AIR LADEN WITH ORGANIC POLLUTANTS

Reinhard Krauss, Holzgerlingen; Horst-Dieter Maass, Stuttgart, and Hans-Werner Brüner, Butzbach, all of Fed. Rep. of Germany, assignors to Metallgesellschaft AG, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 161,099, Jun. 19, 1980, abandoned. This application Nov. 23, 1981, Ser. No. 324,213

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1979, 2925864

Int. Cl.³ B01D 53/04

U.S. Cl. 55—59 **4 Claims**

1. A process for purifying exhaust air from organic pollutants which exhaust air is obtained in an automobile manufacturing plant from a paint drying and underbody coating operation and baking of the coats thus formed which comprises indirectly cooling said exhaust air to a temperature between 20° and 80° C. and removing condensate, feeding the resultant cooled exhaust air to a fixed bed of activated carbon having a particle size in the range of about 2 to 6 mm, a bulk density of 300 to 350 g/l and a BET surface area of 800 to 1800 square meters per gram, removing at least a part of the adsorbate by subjecting the activated carbon laden with organic pollutants to a desorbing treatment by contacting said bed of activated carbon with steam and maintaining said bed at a temperature of 100° to 150° C. during said treatment, the pollutants desorbed from said activated carbon having a modal boiling point of 160° to 200° C., at least 60% of the desorbed pollutants having a boiling point of at least 170° C.

4,377,397

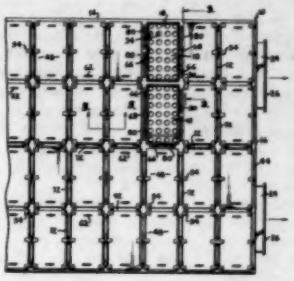
BAGHOUSE WITH ON-LINE MAINTENANCE CAPABILITY

Jack T. Clements, Raytown, Mo., assignor to Standard Havens, Inc., Kansas City, Mo.

Filed Feb. 24, 1982, Ser. No. 351,887

Int. Cl.³ B01D 46/00

U.S. Cl. 55—97 **10 Claims**



1. A method of carrying out on line servicing of filter bags in a baghouse having a housing, dirty and clean air plenums in the housing separated by a tube sheet from which the filter bags are suspended, and a plurality of normally closed access doors providing access to the clean air plenum when open, said method comprising the steps of:

installing a plurality of removable gates in the clean air plenum in a configuration to form a substantially enclosed service compartment in the clean air plenum located above the filter bags that are to be serviced and below a preselected access door while said preselected door remains closed, thereby substantially isolating said service compartment from the remainder of the clean air plenum;

opening said preselected door to provide access to said service compartment and the filter bags therein;

servicing the filter bags in said service compartment;

closing said preselected door; and

removing said gates from the clean air plenum to reestablish communication between said service compartment and the remainder of the clean air plenum.

4,377,398

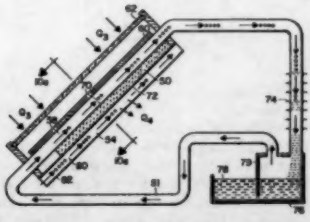
HEAT ENERGIZED VAPOR ADSORBENT PUMP

Charles E. Bennett, Scottsdale, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Continuation of Ser. No. 952,185, Oct. 16, 1978, abandoned, which is a division of Ser. No. 789,482, Apr. 21, 1977, Pat. No. 4,165,952. This application Nov. 9, 1979, Ser. No. 92,797

Int. Cl.³ B01D 53/04

U.S. Cl. 55—208 **3 Claims**



1. Apparatus for reclaiming moisture in liquid form from a gas/moisture mixture having an ambient temperature, comprising in combination:

solid means for adsorbing the moisture from the gas/moisture mixture, said solid means for adsorption having a first and a second side enclosed within first and second plenums, respectively, said first and second sides being in contact with the gas/moisture mixture, said solid means for adsorbing comprising primarily a microporous material having pore sizes in the range of from 10^{-6} to 10^{-7} centimeters for providing high adsorption and surface diffusion characteristics;

means for providing a temperature gradient across said solid adsorption means to cause said second side to have a higher temperature than said first side, said first side being no lower in temperature than the ambient temperature, said moisture being adsorbed into said first side, transported to said second side by means of said surface diffusion characteristics of said solid adsorption means and desorbed from said second side to reduce the moisture content of the gas in contact with said first side and to increase the moisture content of the gas on said second side simultaneously, thereby increasing the gas pressure on said second side and decreasing the gas pressure on said first side, thereby creating an adverse pressure across said solid adsorbing means, said adverse pressure causing a bulk gas flow through any macroporous component or microporous component of said solid adsorbing means in a direction from said second to said first side, said bulk gas flow being lower in volume than said surface diffusion flow through said solid microporous adsorbing means, thereby resulting in a net gas flow from said first to said second side, thereby causing a moisture pumping action from said first to said second side;

means for condensing the moisture from the gas/moisture mixture on said second side to produce the liquid, said condensing means being no lower in temperature than the ambient temperature; and

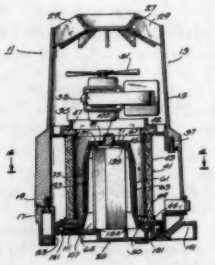
conduit means for joining said condensing means to said second side plenum.

4,377,399

AIR FRESHENING DEVICE

John D. Bryson, Milwaukee, Wis., assignor to Vaportek, Inc., Milwaukee, Wis.

Filed Feb. 6, 1981, Ser. No. 231,985
Int. Cl.³ B01F 3/04
U.S. Cl. 55—226 **6 Claims**



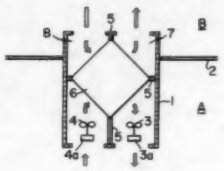
1. An air freshening device comprising an upright housing including, adjacent the bottom thereof, air inlet means and, adjacent the top thereof, air discharge means, fan means in said housing intermediate said air inlet means and said air discharge means for causing air flow through said housing, filter means in said housing intermediate said air inlet means and said fan means, means within said housing for introducing into the air flow downstream of said filter means a substance to be dispensed, said substance introducing means comprising means defining a substantially closed chamber including valve means operable between open and closed positions, a detachably connected member affording access to said chamber and movable to operate said valve means, means detachably connecting said means defining said chamber to said housing so as to removably support said filter means in said housing and so as to afford access to said filter means, and a package of the substance to be dispensed located in said chamber.

4,377,400

HEAT EXCHANGER

Kunio Okamoto, and Akira Fukami, both of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Nov. 5, 1981, Ser. No. 318,563
Claims priority, application Japan, Nov. 11, 1980, 55-158956; Nov. 12, 1980, 55-159827; Feb. 18, 1981, 56-22806
Int. Cl.³ B01D 51/00
U.S. Cl. 55—269 **1 Claim**



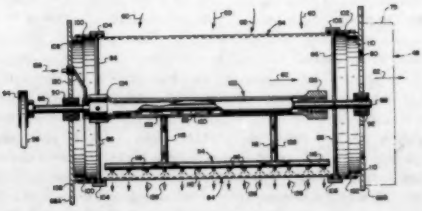
1. A heat exchanger for use in a ventilation system having a first path of outgoing room air and a second path of incoming fresh air, said heat exchanger being adapted to be disposed at the point where said first and second paths cross each other and to perform exchange of both of actual and latent heat between said outgoing and incoming airs, said heat exchanger comprising a laminated structure formed by at least two corrugated sheets wherein the ridges of adjacent sheets cross each other and a substantially flat partition laminate sheet capable of transferring moisture, actual and latent heat sandwiched between said corrugated sheets, one of said corrugated sheets cooperating with one side layer of said partition sheet to define a first series of passages for the outgoing air, the other corrugated sheet cooperating with the other side layer of said partition sheet to define a second series of passages for the incoming air, wherein said the other side layer of said partition sheet is formed of a paper-like material including activated carbon fibers capable of adsorbing contaminants suspended by air and said one side layer of said partition sheet is formed of a paper-like material including non-activated carbon fibers incapable of adsorbing contaminants suspended by air.

4,377,401

ROTARY FILTER FOR FIBER PRODUCT

Sidney J. Laughlin, P.O. Box 218, Rogers, Tex. 76596

Filed Jun. 15, 1981, Ser. No. 273,360
Int. Cl.³ B01D 46/04
U.S. Cl. 55—290 **1 Claim**



1. A rotary filter for use in a processing system for fiber product or the like for removing airborne lint from an air stream, agglomerating the lint and delivering it to a discharge outlet for further processing, comprising, in combination:

settling means having a housing enclosing a settling chamber and having an air stream inlet, a lint discharge outlet and a clean air outlet;
a rotor shaft mounted for rotation within said chamber;
a rotatable screen drum mounted on said rotor shaft for rotation within the settling chamber and interposed between the air stream inlet and the clean air outlet whereby the entrained lint is accumulated on the screen as the air stream flows through the screen and out of the clean air outlet, and whereby the accumulated lint deposit is presented to the lint discharge outlet as the screen turns;
means coupled to said settling chamber for inducing the flow of air through the air stream inlet and out of the clean air outlet;
means forming a rotatable seal between said drum and said settling chamber housing;
means coupled to said drum for removing accumulated lint from said screen, said lint removing means including an air distribution bar disposed within said drum, said distribution bar having a plurality of air jet nozzles for directing pressurized air through said screen;
means coupled in fluid communication with said distribution bar for conveying pressurized air to said bar from an external source, said pressurized air means including a tube defining an air supply plenum disposed about said rotor shaft;
means defining a rotary fluid seal between said shaft and said plenum tube; and,
a stand-off conduit mechanically supporting said distribution bar adjacent said screen drum and connecting said distribution bar in fluid communication with said air supply plenum.

4,377,402

CO_2 SNOW-MAKING PROCESS

Orland F. Crowe, Fort Smith, Ark.; Richard E. Gaber, Houston, Tex., and James R. Forbes, Lockport, Ill., assignors to Liquid Carbonic Corporation, Chicago, Ill.

Filed Jun. 1, 1981, Ser. No. 269,264
Int. Cl.³ F25J 1/00
U.S. Cl. 62—10 **5 Claims**

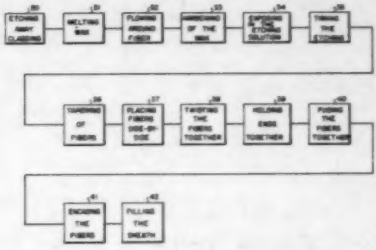
1. A method of providing metered quantities of CO_2 snow, which method comprises
supplying liquid CO_2 from a source at a pressure between about 200 and about 325 psig.,
subcooling said liquid CO_2 to a temperature at least about 20° F. below the equilibrium temperature thereof at said pressure by heat-exchange with a refrigerant having a lower temperature provided by a mechanical refrigeration unit,
periodically expanding said subcooled liquid CO_2 by passage through expansion means to create CO_2 snow for delivery to a receiver to be refrigerated,
monitoring the temperature of said subcooled liquid CO_2 upstream of said expansion means, and
delivering a metered quantity of CO_2 snow to each said receiver by automatically changing the duration of time of said periodic expansions relative to said temperature monitored.

4,377,403

METHOD OF FABRICATING A FUSED SINGLE-MODE FIBER BIDIRECTIONAL COUPLER

Matthew N. McLandrich, Oceanside, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 29, 1980, Ser. No. 191,563
Int. Cl.³ C03B 37/14; C03C 25/06
U.S. Cl. 65—3.11 **9 Claims**



1. A method of fabricating a single-mode evanescent coupling of light between two single-mode fibers each provided with a cladding having an outer diameter of approximately one-hundred microns and enclosing a core, comprising:
etching away a substantial portion of the cladding about the core of each single-mode fiber along a predetermined length, wherein the step of etching includes exposing the fibers in a hydrofluoric acid solution a sufficient period of time to etch away a sufficient amount of the claddings to assure the evanescent coupling of light, the step of etching includes the inserting of each of the fibers through an opening and the exposing of the inserted portions of the fibers to the etching solution and the etching includes the wax-masking of the fibers where they are inserted into being exposed to the etching solution to present a continuous smooth transition into the etching solution;
placing the etched lengths in a side-by-side relationship;
twisting the etched lengths longitudinally about each other to assume a closely abutting helical disposition;
securing the ends of the etched longitudinally twisted fibers to maintain their closely abutting helical relationship; and
fusing the longitudinally twisted etched lengths together in the closely abutting helical shape to assure the evanescent coupling.

2. A method according to claim 1 in which the wax-masking is done by melting beeswax causing it to flow through the opening through which each of the fibers is inserted and around each of the fibers.

4,377,404

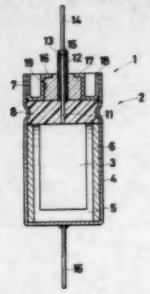
HERMETIC GLASS-TO-METAL SEAL AND METHOD FOR MAKING SAME

Takeshi Hoshikawa, Neyagawa, and Iwao Takinami, Toyonaka, both of Japan, assignors to Matsuo Electric Company Limited and Osaka City, both of Osaka, Japan

Filed Jul. 10, 1981, Ser. No. 282,144
Claims priority, application Japan, Jul. 19, 1980, 55-98924; Jul. 19, 1980, 55-98925
Int. Cl.³ C03C 29/00
U.S. Cl. 65—59.22 **4 Claims**

1. A method of forming a hermetic glass-to-metal seal in a first opening of a metal member, comprising the steps of:
fusing a glass to form a glass tube, said glass containing (1) 67–71% of silicon dioxide, (2) 3–5% of aluminum oxide, (3) 12–14% of boric anhydride, (4) 8–10% of sodium oxide, (5) 3–6% of barium oxide, or calcium oxide, or a mixture of both, and (6) from 1 to under 2% of lithium oxide;

cutting said glass tube across its longitudinal axis to obtain a glass bead having a second opening therethrough;
placing said glass bead in said first opening;
inserting a metal conductor through said second opening;



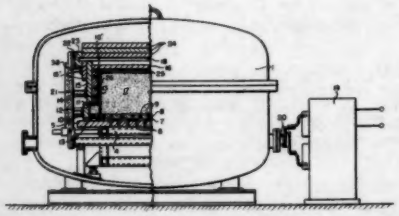
heating the resultant assembly above the melting point of said glass bead; and
cooling the heated assembly.

4,377,405

METHOD FOR THE PRODUCTION OF FLAT, TRANSPARENT VITREOUS SILICA SLABS OF LOW BUBBLE CONTENT

Lutz Brandt, Maintal; Karl Kreutzer, Gelnhausen-Meerholz; Karlheinz Rau, Hanau; Horst Schmidt, Rodenbach, and Fritz Simmat, Gelnhausen, all of Fed. Rep. of Germany, assignors to Heraeus Quarzschmelze GmbH, Quarzstrasse, Hanau, Fed. Rep. of Germany

Filed Apr. 16, 1981, Ser. No. 254,579
Claims priority, application Fed. Rep. of Germany, May 7, 1980, 3017392
Int. Cl.³ C03B 5/225, 5/235, 5/42, 20/00
U.S. Cl. 65—136 **7 Claims**



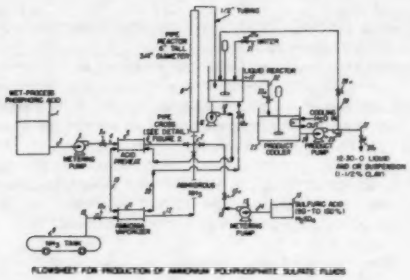
1. In a method of producing a flat, transparent body of vitreous silica of optical quality and low bubble content, in which granules of powder of ground, crystalline quartz, amorphous vitreous silica or pure quartz sand, as starting material are melted in a crucible under vacuum by means of an electrical heating means, the improvement for the production of large-area vitreous silica bodies with a thickness of more than 10 cm, but not more than 150 cm, and with both length and breadth dimensions greater than the thickness, wherein said starting material is heated from above in a melting crucible which has a wall means, the heat isolation power of which increases from the bottom to its top edge and is melted while sustaining a heat flow directed substantially from said top edge to said bottom of the crucible.

4,377,406

AMMONIUM POLYPHOSPHATE SULFATE FERTILIZERS FROM WET-PROCESS PHOSPHORIC ACID

Frank P. Achorn, Killen, and Kenneth E. McGill, Sheffield, both of Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation-in-part of Ser. No. 285,213, Jul. 20, 1981, now Defensive Publication No. T101,901. This application Jan. 4, 1982, Ser. No. 336,662
Int. Cl.³ C05B 1/06
U.S. Cl. 71—36 **2 Claims**



FLOWSHEET FOR PRODUCTION OF AMMONIUM POLYPHOSPHATE SULFATE FLUIDS

1. An improved process for preparing ammonium polyphosphate sulfate suspensions, which suspensions are eminently suitable for use in frigid climates, which process consists essentially of simultaneously supplying, at a temperature range of about 50° F. to about 200° F., a stream of anhydrous ammonia to the common pipe-cross section of a pipe-cross reactor, substantially all enthalpy added thereto over and above that supplied by the ambient temperature environment being supplied by heat exchange means communicating with a later mentioned liquid fertilizer reactor means; simultaneously supplying, at a temperature range of about 50° F. to about 200° F., a stream of merchant-grade phosphoric acid to the cross section of said pipe-cross reactor, said phosphoric acid having a P_2O_5 content in the range from about 50 percent to about 58 percent, substantially all enthalpy added thereto over and above that supplied by the ambient temperature environment being supplied by heat exchange means communicating with a later-mentioned liquid fertilizer reactor means; simultaneously supplying, at a temperature range of about 50° F. to about 100° F., a stream of sulfuric acid to said cross section of said pipe-cross reactor, said sulfuric acid containing from about 90 to about 130 percent by weight H_2SO_4, said streams of phosphoric acid and sulfuric acid contacting said anhydrous ammonia introduced into said common pipe section of said pipe-cross reactor at said cross section of said pipe-cross reactor at a temperature sufficiently high so that additional water is not necessary for continuous operation and in predetermined quantities relative to one another to effect in the resulting molten ammonium polyphosphate sulfate formed in a later-mentioned step an $N:P_2O_5$ ratio ranging from 0.35 to about 0.39; subsequently introducing reaction product resulting from contacting said anhydrous ammonia, phosphoric acid, and sulfuric acid into a vapor tube extension of said pipe-cross reactor to ensure continued intimate contact therebetween; subsequently discharging from the downstream end of said vaporization tubular extension an essentially anhydrous molten ammonium polyphosphate sulfate and introducing said discharged sulfate into liquid fertilizer reactor means; simultaneously with said introduction of said sulfate, introducing into said liquid fertilizer reactor means a stream of aqueous medium in quantities to supply water of formulation thereto sufficient to effect the formation of liquid fertilizers nominally of grades 12-30-0-(2-8)S; subsequently adding to said nominal grades of 12-30-0-(2-8)S about 1½ percent by weight gelling clay; intimately mixing

said clay with said liquid fertilizer and effecting the formation of a resulting liquid fertilizer suspension product; said resulting liquid fertilizer suspension product characterized by the fact that the solidification temperature thereof is about −25° F.

4,377,407

ISONICOTINANILIDE DERIVATIVES, PLANT GROWTH REGULATING COMPOSITIONS AND USE

Norio Shirakawa, Saitama; Hiromi Tomioka; Masuo Koizumi, both of Tokyo; Masaki Takeuchi, Ohmiya; Hiroshi Sugiyama, Tokyo; Masanori Okada, Niiza; Masahiro Yoshimoto, Tokyo; Yoshitaka Iwane, Yokohama, and Yasushi Murakami, Tokyo, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

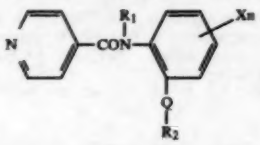
Filed Sep. 28, 1981, Ser. No. 306,582

Claims priority, application Japan, Sep. 30, 1980, 55-135112; May 14, 1981, 56-71424; Jul. 2, 1981, 56-102257

Int. Cl.³ A01N *43/40*; C07D *213/81*

U.S. Cl. 71—76 **9 Claims**

1. A compound of the formula (I)

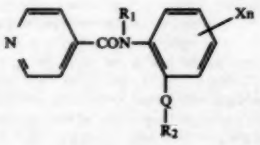


(I)

wherein R_1 is a hydrogen atom or a C_1–C_4 alkyl group; X is a halogen atom or methyl; n is an integer of from 0 to 2; R_2 is phenyl or halo-substituted phenyl; and Q is

or —CH_2—.

7. A plant growth regulating composition comprising an agriculturally acceptable diluent and as active component an effective amount of one or more compounds of the formula



(I)

wherein R_1 is a hydrogen atom or a C_1–C_4 alkyl group; X is a halogen atom or methyl; n is an integer of from 0 to 2; R_2 is phenyl or halo-substituted phenyl; and Q is

or —CH_2—.

4,377,408

HERBICIDAL DERIVATIVES OF 5-PHENOXY-4(3H)-QUINAZOLINONE-1-OXIDE

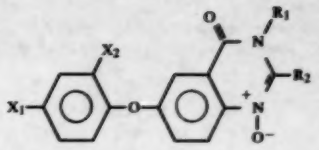
James J. Steffens, Yardley, Pa., assignor to Rhone-Poulenc Agrochimie, Lyons, France

Filed Jul. 27, 1981, Ser. No. 286,747

Int. Cl.³ A01N *21/00*; C07D *239/90*

U.S. Cl. 71—92 **5 Claims**

1. A herbicidal compound of the formula



wherein X_1 is trihalomethyl; X_2 is halo; R_1 is hydrogen or (C_1–C_5) alkyl, which may be unsubstituted or substituted with hydroxy, (C_2–C_3) alkoxy, cyano, halo or (C_1–C_3) COO alkyl; and R_2 is hydrogen.

5. A method for combating unwanted plants which comprises contacting them with a herbicidally effective amount of a compound according to claim 1.

4,377,409

STAINLESS STEEL SHORT FIBER AND PROCESS FOR PREPARING THE SAME

Hideomi Ishibe, Hirakata, Japan, assignor to Nippon Seisen Co., Ltd., Osaka, Japan

Filed Jun. 25, 1981, Ser. No. 277,208

Claims priority, application Japan, Jun. 27, 1980, 55-88035

Int. Cl.³ B22F *1/00*

U.S. Cl. 75—0.5 R **9 Claims**

1. A stainless steel short fiber being in the form of column and having a diameter in the range of 2 to 20 μm. and an aspect ratio of the length to the diameter in the range of 1 to 50, the diameter being substantially constant over the full length.

4,377,410

CHROMIUM RECOVERY FROM SUPERALLOY SCRAP BY SELECTIVE CHLORINE LEACHING

John A. Thomas, Norval; David L. Jones, and Victor A. Ettel, both of Mississauga, all of Canada, assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jun. 3, 1980, Ser. No. 156,131

Int. Cl.³ C22B *34/32*

U.S. Cl. 75—112 **10 Claims**

1. In a process for separating chromium from other metals in superalloy scrap consisting essentially of chromium alloyed with at least one other metal selected from the group consisting of nickel, cobalt and iron, said scrap being sulfidized with a sulfidizing agent selected from the group consisting of elemental sulfur, nickel sulfide, cobalt sulfide, copper sulfide and mixtures thereof, and melting to form a sulfidized matte, the improvement comprising:

(i) forming said matte into solid fragments,

(ii) subjecting said fragments to an aqueous leaching medium,

(iii) feeding chlorine into said aqueous leaching medium in the presence of a redox couple with agitation at an elevated temperature, said chlorine being fed at a rate to maintain the redox potential below about 600 mV,

(iv) recovering the undissolved sulfidized chromium from said leach medium,

(v) recovering chromium metal from said undissolved sulfidized chromium, and

(vi) recovering the dissolved nickel, cobalt or iron from said leach medium.

4,377,411

ADDITION AGENT FOR CAST IRON

William H. Moore, Whitehall Apts.-6E, Whitehall Rd., Chattanooga, Tenn. 37405

Filed Sep. 8, 1981, Ser. No. 299,711
Int. Cl.³ C22C 33/00
U.S. Cl. 420—578 5 Claims

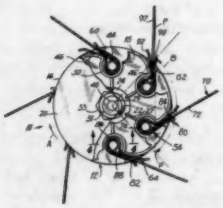
1. An improved inoculating alloy for increasing the strength, fluidity and cleanliness of molten cast iron, containing calcium in the amount of 5.0–8.0%, with the balance consisting essentially of silicon and iron.

4,377,412

IMPROVED ROTARY SCRAPER HAVING FLEXIBLE FINGERS

John S. Viehe, 692 Talamini Rd., Bridgewater, N.J. 08807

Continuation-in-part of Ser. No. 187,714, Sep. 16, 1980, Pat. No. 4,324,017. This application Jul. 7, 1981, Ser. No. 281,096
The portion of the term of this patent subsequent to Apr. 13, 1999, has been disclaimed.
Int. Cl.³ A47L 13/08
U.S. Cl. 15—236 C 12 Claims



1. A rotary scraper device for treating a work surface, comprising:

a generally cylindrical hollow hub casing having a peripheral wall and central axis, and adapted for rotation in one direction about said axis, said hub casing having a closed end wall and an open opposite end;

a cover plate removably mounted on said open end of said hub casing;

a shaft extending axially outward of said cover plate for engagement by rotary motor means;

spaced walls inside said hub defining a plurality of channels chordally disposed in said hub casing and opening at said peripheral wall to receive respectively springy side walls of generally U-shaped spring clips and to receive springy fingers in axial coplanar array within each of said clips; and

a plurality of circumferentially spaced, axially disposed sleeves in said hub casing communicating laterally and tangentially with said channels respectively to receive bights at inner ends of said clips and to receive knuckles at inner ends of said fingers axially disposed inside said bights.

4,377,413

REFRACTORY COMPOSITION FOR FLOW CASTING

Mitsuo Nomura, Kimitsu; Shigeru Amano; Sho Okubo, both of Kisarazu; Takuo Hosaka, Toyota; Kunihiko Shiraishi, Toyota, and Ryuzi Adachi, Toyota, all of Japan, assignors to Nippon Steel Corporation and Nippon Crucible Company, Ltd., both of, Japan

Filed Jul. 30, 1981, Ser. No. 288,300
Claims priority, application Japan, Aug. 8, 1980, 55-108926
Int. Cl.³ C04B 19/04
U.S. Cl. 106—76 1 Claim

1. A refractory composition for flow casting substantially comprising: 100 parts by weight of refractory material, 0.1–2 parts by weight of sparingly water-soluble aluminum tripolyphosphate, 0.2–2 parts by weight of alkali metal silicate, 0.5–5 parts by weight of clay, up to 2/5 part by weight of organic binder per amount of clay, and 0.2–4 parts of at least one hardening promoting reagent selected from the group consisting of calcium silicate and calcium aluminate.

4,377,414

SHAPED CEMENTITIOUS PRODUCTS

John C. Buschmann, Columbia, Md.; Elizabeth L. Rasmussen, Hoth, Denmark; William C. Webster, Norristown, Pa., and Preston L. Veltman, Severna Park, Md., assignors to A/S Niro Atomizer, Denmark

Filed Sep. 4, 1980, Ser. No. 184,069
Int. Cl.³ C04B 1/00
U.S. Cl. 106—85 26 Claims

1. A process for preparing a dense shaped article, said article comprising fly ash particles bonded together by cementitious reaction products, said process comprising the steps of:

(a) providing a substantially dry fly ash-containing powder obtained from the dry scrubbing of fly ash-containing flue gas with lime in a spray drying system, said fly ash-containing powder comprising fly ash in intimate admixture with microparticulate crystallites of scrubber reaction materials selected from the group consisting of calcium sulfite, calcium sulfate, hydrates of calcium sulfite and calcium sulfate, calcium oxide, calcium hydroxide and mixtures thereof;

(b) uniformly contacting said fly ash-containing powder with a predetermined amount of water to produce a powder/water mixture;

(c) forming said powder/water mixture into a shaped article by confined compaction at a predetermined compactive effort sufficient to provide a handleable green body;

said predetermined amount of water being selected as at least that amount sufficient to satisfy the short term hydration demands of said powder and further selected in combination with a selected predetermined compactive effort to produce a green body having an uncured dry density in the range of from about 95 to about 140 pounds per cubic foot and wherein the interspatial voids between the fly ash particles in said green body are sufficient to accommodate the subsequently formed cementitious reaction products without deleterious expansion of the article; and

(d) curing said green body product in a moist atmosphere to form a shaped article bonded by said cementitious reaction products.

4,377,415

REINFORCED CEMENT SHEET PRODUCT CONTAINING WOLLASTONITE FOR REDUCED SHRINKAGE

Robert M. Johnson, and Elmer M. Melling, both of Kenmore, N.Y., assignors to National Gypsum Company, Dallas, Tex.

Filed Feb. 11, 1981, Ser. No. 233,664
Int. Cl.³ C04B 7/02
U.S. Cl. 106—90 21 Claims

1. A cement-wollastonite product comprising Portland cement binder in an amount of between about 40% and 90% by

weight an wollastonite in an amount of between about 10% and 60% by weight to provide low wet-to-dry dimensional changes.

4,377,416

MASONRY CEMENT COMPOSITION, MASONRY CONSTRUCTION AND METHOD

Peter L. Maul, Addison, Ill., and Albert E. Robertson, Jackson, Miss., assignors to American Colloid Co., Skokie, Ill. and United Cement Co., Jackson, Miss.

Filed Nov. 30, 1981, Ser. No. 325,689
Int. Cl.³ C04B 7/02
U.S. Cl. 106—98 **18 Claims**

1. A masonry cement composition comprising Portland cement, about 0.05% to about 0.8% by weight diatomaceous earth and about 5% to about 16% by weight colloidal clay.

4,377,417

TITANIUM DIOXIDE PIGMENT TREATED TO SUPPRESS YELLOWING IN POLYMERS

John R. Brand, Palmerton, Pa., assignor to Gulf & Western Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 288,650, Jul. 30, 1981. This application Dec. 10, 1981, Ser. No. 329,252
Int. Cl.³ C09C 1/36
U.S. Cl. 106—300 **19 Claims**

1. A titanium dioxide pigment for use in polymeric compositions comprising a pyrogenic titanium dioxide pigment which has been treated with a composition comprising an organophosphate/alkanolamine addition product.

4,377,418

PARTICULATE FILLER, COATED WITH MATERIAL BONDED THERETO AND CONTAINING A SULFUR-CONTAINING GROUP WHICH RELEASES SULFUR AS A CURING AGENT FOR S-CURABLE UNSATURATED POLYMERS

James D. Birchall, Mouldsworth, and John G. Carey, Appleton, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 10, 1981, Ser. No. 242,409
Claims priority, application United Kingdom, Mar. 21, 1980, 80 09570
Int. Cl.³ C08K 9/04; C08L 21/00
U.S. Cl. 106—306 **9 Claims**

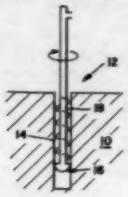
1. A basic particulate filler to the surface of which there is bound through reaction with an acidic group which is part of a material comprising at least one acidic group reactive with the filler which acidic group is linked directly or indirectly to at least one sulphur containing group which is not reactive with the filler but which is decomposable to a sulphur-containing species which is capable of taking part in a sulphur-based curing reaction, in which the acidic group is selected from the group consisting of a saturated aliphatic carboxylic acid group, a salt thereof, and an anhydride thereof, and in which the sulphur-containing group is selected from the group consisting of a polysulphide group, a xanthate group, a thiocarbonate group, a dithiocarbonate, a trithiocarbonate group, a monothiocarbamate group, a dithiocarbamate group, a mercaptol group, a mercaptole group, a thioacetate group, a dithioacetate group, and an isothiouronium group.

4,377,419

STABILIZING CLAY SOIL WITH HYDROXY-ALUMINUM SOLUTION

Marion G. Reed, Hacienda Heights, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jul. 9, 1981, Ser. No. 281,750
Int. Cl.³ C09K 3/00
U.S. Cl. 106—900 **8 Claims**



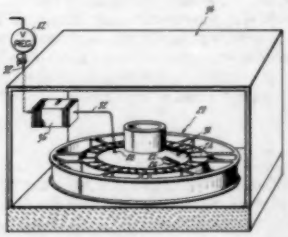
1. A method of stabilizing quick clay and salt clay soil comprising admixing the quick clay and salt clay soil with an effective amount of hydroxy-aluminum solution having a concentration of at least 4 molar.

4,377,420

REMOVAL OF CARBONACEOUS MATERIAL FROM GAS TURBINE CAVITIES

Bronislaw J. Granatek, Vernon, and Lawrence D. Hall, Bristol, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 6, 1980, Ser. No. 127,604
Int. Cl.³ B08B 5/00
U.S. Cl. 134—2 **9 Claims**



1. In the cleaning of a gas turbine engine structure having a substantially closed cavity containing carbonaceous matter and other residue, the improvement comprising:

providing at least one gas entrance port and at least one gas exit port, the ports being located to allow gas to flow through the length of the cavity;

heating the structure to a temperature sufficient to cause the carbonaceous material to oxidize at a substantial rate but insufficient to cause metallurgical or deformation damage to the structure;

supplying air in controlled quantity and pressure to the gas entrance port to cause the air to flow through the length of the cavity to the gas exit port; the quantity being sufficient to oxidize the carbonaceous material upon becoming heated to about the temperature of the structure, but insufficient to substantially cool the structure; and the air having a pressure sufficient to produce the desired steady state flow through the cavity containing the carbonaceous matter, but insufficient to cause permanent distortion of the structure if flow in the cavity is blocked;

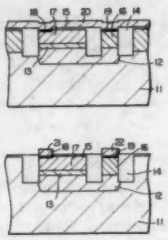
terminating the supply of air; cooling the structure; and, closing the entrance and exit ports.

4,377,421

METHOD OF MAKING A STACKED EMITTER IN A BIPOLAR TRANSISTOR BY SELECTIVE LASER IRRADIATION

Yasuo Wada, Tokyo; Takahide Ikeda, and Masao Tamura, both of Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 12, 1980, Ser. No. 186,743
Claims priority, application Japan, Sep. 12, 1979, 54/116080
Int. Cl.³ H01L *21/263*
U.S. Cl. 148—1.5 12 Claims



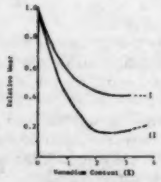
1. A method of fabricating a semiconductor device comprising the steps of:
(a) forming an insulating film on a principal surface of a semiconductor substrate;
(b) removing that part of said insulating film which overlies a portion of said semiconductor substrate where an emitter is to be formed;
(c) depositing a polycrystalline or amorphous silicon film on the entire surface; and
(d) irradiating a selected portion of said polycrystalline or amorphous silicon film with a laser beam to convert that portion of said polycrystalline or amorphous silicon film, which is deposited on said principal surface of said semiconductor substrate without said insulating film therebetween, to a single crystal of silicon, whereby a stacked emitter can be formed protruding from the semiconductor substrate.

4,377,422

HADFIELD'S STEEL CONTAINING 2% VANADIUM

William B. Mackay, Ravensview, and Reginald W. Smith, Inverary, both of Canada, assignors to Queen's University at Kingston, Kingston, Canada

Filed Sep. 8, 1981, Ser. No. 300,134
Claims priority, application Canada, Sep. 12, 1980, 360168
Int. Cl.³ C22D *38/04, 38/12*
U.S. Cl. 148—137 4 Claims



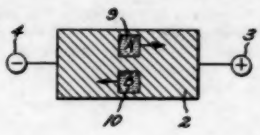
3. A method of heat treating an alloy consisting essentially of:
carbon: 1.1 to 1.4%
manganese: 10 to 14%
silicon: 1% max.
sulphur: 0.06% max.
phosphorus: 0.12% max.
vanadium: 1.2 to 2%
iron: balance
comprising soaking said alloy at a temperature in the range 1050°-1150° C. for at least 6 hours per inch of section and water quenching.

4,377,423

LIQUID METAL INCLUSION MIGRATION BY MEANS OF AN ELECTRICAL POTENTIAL GRADIENT

Thomas R. Anthony, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 221,142, Dec. 29, 1980, abandoned. This application Apr. 28, 1982, Ser. No. 372,857
Int. Cl.³ H01L *21/326, 21/225*
U.S. Cl. 148—171 26 Claims



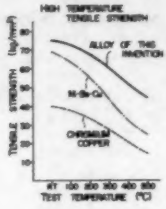
1. A method for migrating one or more liquid metal inclusions in a host body of single crystal semiconductor material by means of an electrical potential gradient to produce one or more regions of recrystallized single crystal semiconductor material in said host body of semiconductor material, said regions having at least a resistivity different from that of said host body of semiconductor material, comprising the steps of:
(a) determining the direction said one or more liquid metal inclusions are to be migrated along one or more paths in said host body between anode and cathode connections;
(b) depositing one or more solid metallic bodies in contact with said host body, the material of each said solid metallic body being selected such that the material of each said solid metallic body:
(i) is soluble in the semiconductor material of said host body, and
(ii) forms a solution with the semiconductor material of said host body, said solution having a melting temperature lower than the melting temperature of the semiconductor material of said host body, and
(iii) has a work function, ϕ_i, such that the quantity $(\phi_i - \phi_h)$, where ϕ_h is the work function of the semiconductor material of said host body, has the same algebraic sign as the connection toward which said one or more inclusions are to be migrated;
(c) applying said anode and cathode connections to said host body;
(d) heating said host body to an elevated temperature, said elevated temperature being substantially constant and uniform throughout said host body and sufficient to melt said one or more solid metallic bodies forming thereby one or more liquid metal inclusions;
(e) applying said electrical potential gradient between said anode and cathode connections; and
(f) migrating by means of said electrical potential gradient said one or more liquid metal inclusions in said host body along said path or paths forming thereby one or more regions of recrystallized single crystal semiconductor material integral with said host body, each said region of recrystallized single crystal semiconductor material comprising the material of the liquid metal inclusion which formed said region in solid solution up to the solid solubility limit of the material of said liquid metal inclusion in the semiconductor material of said host body and having at least a resistivity different from that of the semiconductor material of said host body.

4,377,424

MOLD OF PRECIPITATION HARDENABLE COPPER ALLOY FOR CONTINUOUS CASTING MOLD

Yutaka Hirao, Toyama; Kunio Hata, Kurobe; Masao Hosoda, and Ryoichi Ishigane, both of Toyama, all of Japan, assignors to Chuetsu Metal Works Co., Ltd., Tokyo, Japan

Filed May 20, 1981, Ser. No. 265,390
Int. Cl.³ C22C 9/06
U.S. Cl. 148—414 7 Claims



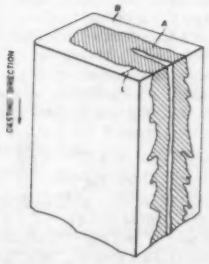
1. A mold for continuous casting of metals having high strength, high thermal conductivity and high heat resistance consisting of a precipitation hardenable alloy consisting essentially, by weight, of 0.2–2.0% nickel, 0.05–0.5% beryllium, 0.01–1.0% niobium and the balance essentially copper, wherein the mold has an electric conductivity of at least 65% IACS.

4,377,425

CAST INGOT OF ALUMINUM ALLOY AVAILABLE FOR ROLLING OPERATION AND METHOD FOR MANUFACTURING THE SAME

Takeshi Otani, Yokohama; Osamu Watanabe, Minoo, and Masashi Sakaguchi, Sakai, all of Japan, assignors to Showa Aluminum Ind. K.K., Minato and Showa Aluminum Corp., Sakai, both of, Japan

Filed Nov. 19, 1980, Ser. No. 208,383
Claims priority, application Japan, Nov. 20, 1979, 54-150942
Int. Cl.³ C22C 21/00
U.S. Cl. 148—437 6 Claims



1. A direct chill cast ingot of an aluminum alloy selected from the group consisting of AA 1000 series and AA5000 series aluminum alloys, wherein said aluminum alloy comprises from about 0.0005 to about 0.05 weight percent calcium and has a grain size smaller than 150 microns in a region extending inward of a coarse cell zone on the surface area of the cast ingot, in the vicinity of said coarse cell zone said ingot being free of observable fir-tree structures on its outer surface and being suitable for rolling operations.

4,377,426

PYROTECHNIC PROCESS

Michael K. Levenson, Tempe, Ariz., assignor to Pyrodex Corporation, Shawnee Mission, Kans.

Filed Jul. 24, 1980, Ser. No. 171,839
Int. Cl.³ C06B 21/00
U.S. Cl. 149—109.6 1 Claim

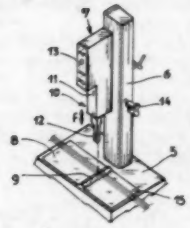
1. A process for producing strong, uniform granules of a pyrotechnic composition consisting of a mixture of at least one inorganic oxidizing agent, an aromatic carboxylic acid salt, water, and optional adjuvants, which comprises: (1) mixing approximately 4.0 to 7.0 parts of dextrin, approximately 0.1 to 3.0 parts of guar gum and approximately 8 to 15 parts of water with 100 parts of said pyrotechnic composition, (2) intimately blending the resulting mixture under conditions of at least moderate shear until the granules are relatively uniform in size, and (3) drying the water-wet granules to the desired water content.

4,377,427

PROCESS FOR THE MANUFACTURE OF LOCKS OF HAIR FROM SYNTHETIC FIBERS, DEVICE FOR PUTTING THIS PROCESS INTO OPERATION AND LOCKS OF HAIR THUS OBTAINED

Alain François, Meudon, France, assignor to R. George S.A., Paris, France

Filed Oct. 30, 1980, Ser. No. 202,229
Claims priority, application France, Nov. 20, 1979, 79 28572
Int. Cl.³ B29C 27/08; B30B 15/06; B32B 31/18
U.S. Cl. 156—73.2 2 Claims



1. Process for manufacturing locks of hair from synthetic fibers grouped in a bundle, comprising successively effecting on the bundle, by ultrasonic means, soldering of the fibers to one another at spaced locations, and cutting of the welded fibers at said locations, the energy emitted by said ultrasonic means being directed toward the precise location to be welded, said ultrasonic means being moved downwardly toward said location in two successive steps, the first step corresponding to the welding and the second step corresponding to the cutting, said ultrasonic means subsequently being raised again, ultrasonic waves being emitted only during said steps of said downward movement.

2. Apparatus for manufacturing locks of hair from synthetic fibers grouped in a bundle, comprising

(a) a platform (8) having a ridge with a pointed surface (9) directed towards a source of energy;

(b) a vertically moveable element (10) positioned above said platform (8) and separated therefrom by a space for separating said bundle of fibers, said element comprising an ultrasonic emitter (11) and an ultrasonic tool (12); and

(c) means for displacing said element and for programming

(i) said displacement for two-stage descent and continuous ascent; and

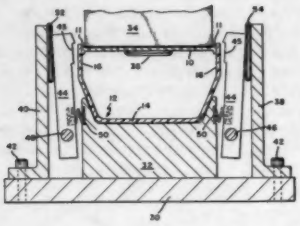
(ii) activation of said ultrasonic emitter during said descent and deactivation during said ascent.

4,377,428

METHOD OF FRICTION WELDING

Leslie Toth, Brookfield, Conn., assignor to Branson Ultrasonics Corporation, Newtown, Conn.

Division of Ser. No. 273,628, Jun. 15, 1981, Pat. No. 4,352,711.
This application Jul. 2, 1982, Ser. No. 394,710
Int. Cl.³ B29C 27/08
U.S. Cl. 156—73.5 5 Claims



1. A method of friction welding a thermoplastic reinforcing plate to a thermoplastic U-shaped channel, the latter including a base and two upstanding legs comprising:

supporting said channel in a first support means;

supporting said plate in a second support means within said channel in a manner to dispose each of the opposite lateral edges of said plate in abutting contact with a respective inside surface of each of said legs;

applying a force to the outside surface of each of said legs for causing each of said legs to be in forced abutting surface contact with said plate along said two opposite edges of said plate, and

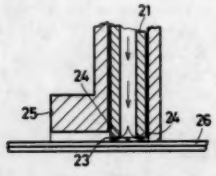
causing said first and second support means to undergo relative linear reciprocating motion along an axis parallel to the longitudinal axis of said plate during a weld time interval for causing thermoplastic material along said respective abutting surface contacts to melt and upon cessation of said motion to rigidify whereby said plate becomes welded to said channel.

4,377,429

WELDING OF PLASTICS MATERIAL

Friedrich Struve, Johannesburg, South Africa, assignor to Gundle Holdings (Proprietary) Limited, Edenvale, South Africa

Filed Jul. 29, 1981, Ser. No. 287,978
Claims priority, application South Africa, Mar. 13, 1981, 81/1667
Int. Cl.³ B29C 27/02; B65H 69/08
U.S. Cl. 156—153 15 Claims



1. A method of welding together surfaces of thermoplastic material comprising:

(a) depositing a continuous layer of molten thermoplastic welding material over adjacent areas of the surfaces to be welded together;

(b) substantially simultaneously with the deposition of the welding material, circularly smearing a boundary layer of the welding material which is in contact with the surfaces to be welded onto the adjacent areas of the surfaces so that the welding material being smeared is subjected to shear forces transverse to the direction of deposition of the layer of welding material; and

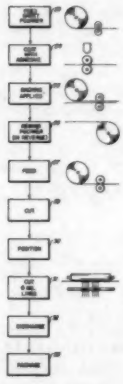
(c) allowing the layer of deposited thermoplastic welding material to solidify.

4,377,430

PROCESS OF MAKING BOOK COVERS

Robert G. Bexley, 46 Southwind Cir., St. Augustine, and Barry South Thomson, 26 Sandpiper Dr. South, St. Augustine Beach, both of Fla. 32084

Filed Apr. 6, 1981, Ser. No. 251,393
Int. Cl.³ F27B 21/00
U.S. Cl. 156—184 4 Claims



1. A process of making a backing cover including the steps of:

feeding polymer sheet material from a roll of polymer sheet material;

coating adhesive onto one side of polymer sheet being fed from a roll of polymer material into spaced coats;

applying sheet backing material to each of said adhesive coats from a pair of rolled sheet backing material;

rewinding said polymer material having said covered adhesive thereon backwards onto a roll;

feeding said rewound polymer material from said roll;

cutting and discharging sheets from said polymer sheet and covered adhesive thereon; and

cutting a plurality of lines a portion of the way through polymer sheet, including cutting lines from five to seven mils into said polymer sheet material.

4,377,431

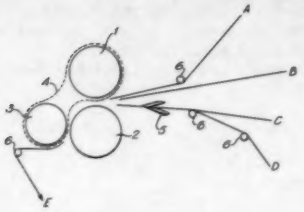
PLEATING AND LAMINATING

Edward Chodosh, 28 Northiam St., London, E8 4RY, England

Continuation-in-part of Ser. No. 100,439, Dec. 5, 1979, abandoned. This application Feb. 26, 1981, Ser. No. 238,164
Claims priority, application United Kingdom, Dec. 5, 1978, 47255/78
Int. Cl.³ B31F 1/00
U.S. Cl. 156—204 2 Claims

1. A method of producing a laminated, pleated fabric, which comprises (a) passing a layer of fabric through a pleating machine to form a first layer of fabric having temporary pleats therein; (b) feeding the first layer of fabric together with (1) a web of heat-or-steam-activatable adhesive material and (2) a second layer of fabric to a winding roller where the three layers are wound together, the adhesive layer being disposed

between the first and second fabric layers, all three layers being substantially co-extensive in size; and (c) heating or steaming the wound layers so as to activate the adhesive material,



thereby laminating the second layer of fabric onto the first layer of fabric and simultaneously making permanent the pleats in said first layer of fabric.

4,377,432

METHOD AND APPARATUS FOR AFFIXING LABELS AND FOILS TO BOTTLES

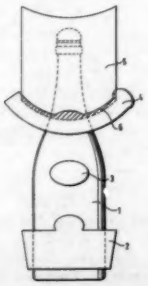
Rudolf Zodrow, Düsseldorf, and Hans-Werner Mohn, Kaarst, both of Fed. Rep. of Germany, assignors to Jagenberg-Werke AG, Düsseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 129,763, Mar. 12, 1980. This application Dec. 11, 1980, Ser. No. 215,464

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1979, 2949882

Int. Cl.³ B29C *17/04*; B32B *31/00*

U.S. Cl. 156—215 **3 Claims**



1. In the affixing of neck labels and foils to bottles at their neck portion wherein precut labels and foils are picked up at a station and glue-coated, turned over, and pressed onto the bottles by their glue-coated surfaces, the improvement which comprises feeding each foil and its respective neck label to the pickup station in such a way that during the pickup the lower edge of the foil is covered by the upper edge of the neck label, and pressing both foil and neck label onto the neck portion of the bottle substantially simultaneously in a single operation.

4,377,433

LAMINATING AND COATING ADHESIVE, ITS MANUFACTURE AND USE

Ekkehard Merz, and Robert Singer, both of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed May 20, 1981, Ser. No. 265,542

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1980, 3032678

Int. Cl.³ C09J *3/16*; B05D *3/02*

U.S. Cl. 156—326 **14 Claims**

1. A laminating and coating adhesive in aqueous dispersion form comprising:

(1) an aqueous dispersion of a copolymer of monomer units selected from the group consisting of:

(a) a vinyl ester of an alkanoic acid having from 1 to 18 carbon atoms,

(b) an acrylic acid ester of an alkanol having from 1 to 18 carbon atoms, and

(c) mixtures thereof, with

(d) from 0.1% to 10% by weight, based on the total monomer content of an ethylenically-unsaturated functional group-containing monomer having hydroxyl and carbonyl groups as functional groups selected from the group consisting of alkenoic acids having from 3 to 8 carbon atoms, alkenedioic acids having from 4 to 8 carbon atoms, N-methylolamides of said alkenoic acids and N-methylolamides and di-N-methylolamides of said alkenedioic acids, and

(e) from 0 to 55% of other monomers copolymerizable with components (a), (b), (c) and (d),

(2) from 0.05% to 20% by weight, based on the copolymer weight, of an expoxy compound having at least one epoxy group per molecule and having a mean epoxy equivalent weight of from 80 to 1,000, said epoxy compound being added after completion of copolymerization, and

(3) from 0.05% to 20% by weight, based on the copolymer weight, of a polyamine hardener, said polyamine hardener being added after completion of copolymerization,

said laminating and coating adhesive being capable of laminating at temperatures of between 60° and 100° C.

4,377,434

ROLLER DRIVE FOR AN APPARATUS FOR AUTOMATICALLY LAMINATING CIRCUIT BOARDS

Matthew A. Del Bianco, Chesapeake Isle, North East, Md., and Henry J. Tancredi, Gwynedd, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 17, 1981, Ser. No. 235,415

Int. Cl.³ B65C *9/40*

U.S. Cl. 156—364 **22 Claims**

1. Apparatus for conveying a planar member having a predetermined edge thickness comprising:

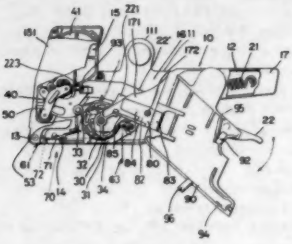
a roller having a peripheral slot tapering to a driving surface, the surface exhibiting a predetermined angle with respect to an axis of rotation of the roller, the driving surface being tapered to a greater extent than the taper of the slot to engage an edge of each article to be conveyed; and

means for rotating the roller about the axis of rotation, the angle of the surface being arranged such that when the member is restrained the roller slips along the driving surface with respect to the member and that when the member is unrestrained the driving surface engages the member to displace the member at a predetermined velocity.

4,377,435
LABELER

Mituo Fujita, Sakatoshi, Japan, assignor to Kabushiki Kaisha Shinsei Industries, Tokyo, Japan

Filed Feb. 12, 1981, Ser. No. 233,766
Claims priority, application Japan, Feb. 21, 1980, 55-20883
Int. Cl.³ B65C 11/02
U.S. Cl. 156—384 7 Claims



1. A labeler comprising:

a case having a carrier strip holder for holding a roll of carrier strip onto which a number of labels are stuck in succession and an opening provided on one side of said case;

an actuating mechanism having an operating part extended into said case and pivotally mounted on the case to be pivotable for movement with the case;

a carrier strip feeding mechanism having a carrier strip feed drum which is housed in said case and engaged with said carrier strip extended from said roll and driven by said operating part during movement thereof for feeding a fixed length of the carrier strip when said drum is driven by said operating part; and

a carrier strip turnback part in said case around the edge of which the carrier strip is turned by the feeding motion of said carrier strip feeding mechanism for separating a label stuck onto the carrier strip, wherein there are provided at least one swing depression member which closely approaches and parts from the outer periphery of the drum of said carrier strip feeding mechanism and depresses the carrier strip against said carrier strip feed drum when said swing depression member closely approaches said drum, and an openable door which is provided to close the opening of said case and with an engaging member which secures said swing depression member on said drum when said door is closed;

wherein said engaging member is a projecting member which is provided on the internal surface of the door and engages with said swing depression member to depress it toward said carrier strip feed drum when the door is closed.

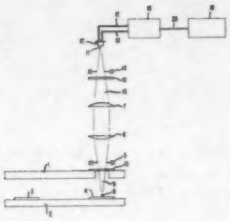
4,377,436
PLASMA-ASSISTED ETCH PROCESS WITH ENDPOINT DETECTION

Vincent M. Donnelly, Berkeley Heights, and Daniel L. Flamm, Chatham Township, Morris County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 149,503, May 13, 1980, abandoned.
This application Nov. 5, 1981, Ser. No. 318,329
Int. Cl.³ H01L 21/306; C23C 15/00
U.S. Cl. 156—626 24 Claims

1. Process for fabrication of an article comprising at least one operation during which the article undergoing fabrication comprises a layer of first material to be etched in at least one preselected region, the layer of first material being overlying a second material to be retained, the first material being etched primarily by a chemical reaction with at least one reactive species produced by a plasma within a plasma reactor, the plasma resulting from imposition of an electrical field across a vapor medium between electrodes, the etching being monitored by means including detection of electromagnetic radiation emitted by an excited species formed as a consequence of a chemical interaction between a species and article material in the preselected region, the means comprising optical path means for illuminating a detector with such radiation, and detector output means, characterized in that

(a) the optical path means sense substantially only radiation



emitted from within a restricted first volume of space adjacent the preselected region, with a contrast of at least 50%, the volume having lateral dimensions less than about 10 mm, and

(b) the processing conditions are chosen to result in confinement of the excited species formed as a consequence of the chemical interaction to a second volume of space close to the preselected region, with at least a part of the first volume being within the second volume.

4,377,437
DEVICE LITHOGRAPHY BY SELECTIVE ION IMPLANTATION

Gary N. Taylor, and Thirumalai N. C. Venkatesan, both of Bridgewater, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 22, 1981, Ser. No. 266,220
Int. Cl.³ B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—628 10 Claims

1. A method of making an article including at least one pattern delineation step CHARACTERIZED by selectively implanting an ionic species into a material and exposing the material to a reactive atmosphere, whereby the implanted species forms a nonvolatile protective compound in implanted regions of said material, with said protective compound comprising at least one implanted species and at least one species derived from the reactive atmosphere, so that the regions of said material so protected are etched at a slower rate than unprotected regions when said material is exposed to a plasma, and etching said material in a plasma, thereby producing a negative tone pattern.

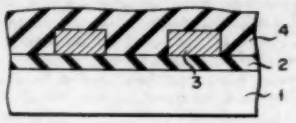
4,377,438
METHOD FOR PRODUCING SEMICONDUCTOR DEVICE

Takahiko Moriya, Yokosuka; Yoshikazu Hazuki, Yokohama, and Masahiro Kashiwagi, Fujisawa, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 22, 1981, Ser. No. 304,677
Claims priority, application Japan, Sep. 22, 1980, 55-130754; Oct. 28, 1980, 55-150179
Int. Cl.³ H01L 21/306; B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—643 12 Claims

1. A method for producing a semiconductor device, comprising the step of forming an insulating film on an uneven surface of a semiconductor body having recesses and projections, the insulating film having recesses and projections corresponding to the recesses and projections of the semiconductor body, and the step of dry-etching said insulating film using a

gas containing carbon-halogen bonds and hydrogen as an etchant, whereby the projection portions of the insulating film



are etched more quickly than the recess portions and the insulating film is provided with a smooth surface.

4,377,439

PULP MILL RECOVERY

Albert J. Liem, Roxboro, Canada, assignor to Domtar Inc., Montreal, Canada

Filed Nov. 20, 1980, Ser. No. 208,666

Int. Cl.³ D21C *11/12*

U.S. Cl. 162—30.1 **5 Claims**

1. A method for the recovery of heat and chemical from residual liquor from a pulp mill comprising; forming a fluidized bed of pellets of inorganic chemical derived from said residual liquor, extracting pellets from said bed and injecting at least a portion of said extracted pellets into a coater dryer, injecting residual liquor from said pulp mill into said dryer, coating said pellets injected into said dryer with said residual liquor and drying said residual liquor on the surface of said pellets injected into said dryer, thereby to form pellets coated with dry residual liquor removing said pellets coated with dried residual liquor from said dryer, injecting said coated pellets into said fluidized bed, oxidizing organic material in said dried residual liquor coating said pellets in said bed and extracting heat from said bed to maintain said bed at an operating temperature.

4,377,440

PROCESS FOR MANUFACTURING OF FORMED PRODUCTS

Stein Gasland, Dreyersvoj 29, 2960 Rungsted Kyst, Denmark

Continuation of Ser. No. 42,222, May 24, 1979, abandoned. This application Mar. 20, 1981, Ser. No. 245,753

Claims priority, application Sweden, May 25, 1978, 780569

Int. Cl.³ D21D *3/00*

U.S. Cl. 162—101 **16 Claims**

1. A method of making a shaped, smooth-surfaced cellulosic paper or paper board article from an aqueous suspension of cellulose fibers, the fibers having been agitated in water so as to become separated from each other and swollen, comprising the steps of:

(a) preparing a homogeneous, plastically formable material by adding to the suspension sufficient hydrocolloid to bind substantially all of the water in the material to prevent it from bleeding out during subsequent shaping and to prevent the fibers from flocculating and by kneading the material, said material containing water in the range of from about 50 to about 90 percent, fibers in the range of from about 8 to about 49 percent, and hydrocolloid in the range of from about 1 to about 20 percent, by weight;

(b) shaping the material into the desired shape by extrusion, injection molding, rolling, pressing or drawing; and

(c) forming hydrogen bonds between the solids of the material by drying the shaped material.

8. A method as claimed in claim 1, wherein the hydrocolloid is added to the aqueous dispersion dissolved or dispersed in a liquid.

4,377,441

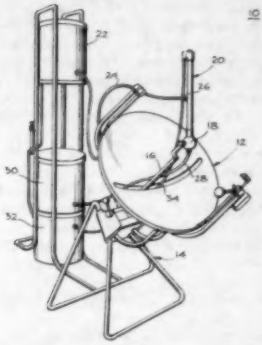
SOLAR HEATED ALCOHOL STILL

Steven D. Kimmell, Granada Hills, Calif., and Jack P. Murphy, deceased, late of Huntington Beach, Calif. (by James P. Murphy, administrator), assignors to Mattel, Inc., Hawthorne, Calif.

Continuation of Ser. No. 244,415, Mar. 16, 1981, abandoned. This application Aug. 4, 1982, Ser. No. 405,049

Int. Cl.³ B01D *3/16, 3/42*

U.S. Cl. 202—153 **4 Claims**



1. A solar heated still comprising a mounting platform; a parabolic reflector pivotally mounted to the platform; a boiler adjustably mounted to the platform by a member extending from the platform through a slot in the reflector to the boiler, whereby the boiler is positioned adjacent the focal point of the reflector; means positioned between the boiler and the member for thermally isolating the boiler from the member; a distilling column mounted atop the boiler and having an open bottom end which directly communicates with the boiler; means for adjusting the position of the boiler so that the distilling column extends vertically above the boiler; an inlet tube having one end mounted within the distilling column for furnishing liquor to the boiler; means within the boiler for controlling the maximum amount of liquor in the boiler including an outlet from the bottom of the boiler, a first valve mounted within the boiler for closing the outlet, a float within the boiler, and means within the boiler responsive to movement of the float for opening and closing the first valve; a second valve mounted within the distilling column and connected to regulate the flow of liquor through the one end of the inlet tube, a temperature sensitive bimetallic spring mounted within the distilling column for detecting the temperature therein; linkage means mounted within the column for coupling the mechanical motion of the spring to the second valve, whereby an increase in the temperature detected by the spring causes the second valve to move in a direction to permit an increase in the flow of liquor through the inlet tube; and means for positioning the reflector to focus the rays of the sun on the boiler.

4,377,442

SYSTEM FOR COUPLING A QUENCHING CAR TO A HOOD CAR AND FOR BRAKING THE HOOD CAR

Georg Mayer, Ratingen, and Franz Theilenberg, Essen, both of Fed. Rep. of Germany, assignors to Hartung, Kuhn & Co. Maschinenfabrik, Fed. Rep. of Germany

Filed May 18, 1981, Ser. No. 264,238

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1980, 3021192

Int. Cl.³ C10B *34/14, 41/00, 45/00*

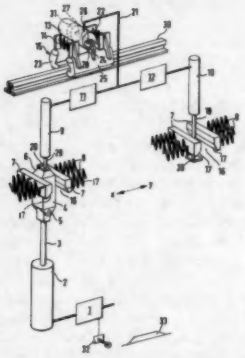
U.S. Cl. 202—263 **3 Claims**

1. Equipment for operating a battery of coke oven machines, in combination said equipment comprising:

a quenching car movable in forward and backward directions of travel parallel to the coke oven battery;

a track mounted hood car movable in forward and backward directions of travel parallel to said coke oven battery and having a hood for trapping and carrying the dirty gases rising from glowing coke on the quenching car;

coupling means between said hood car and said quenching car that is operable when said quenching car is moving in said forward and backward directions for coupling together said hood car and said quenching car and for permitting movement of said hood car and said quenching car together in said forward and backward directions, said coupling means defining a coupling opening in said hood car; said coupling means also including (a) a driver element on said quenching car, (b) a hydraulic coupling control system, and (c) a driver element cylinder-piston actuator operable with a pressurized medium by said hydraulic coupling control system for moving said driver element transversly of the forward and backward directions of travel of said quenching car and said hood car into and out of said coupling opening in said hood car whereby said driver element may be engaged with, or disengaged from, said hood car; said coupling means further including a pair of spaced-apart parallel stop bars defining at least part of said coupling opening, said stop bars being oriented transversely of the directions of forward and backward travel of said hood car and quenching car, said stop



bars being adapted to be horizontally displaced toward and away from each other in substantially parallel relationship; said coupling means additionally including compression coupling springs urging said stop bars towards each other, said stop bars having mutually facing sides which at least partially define diverging surfaces to accommodate entry of said driver element between said stop bars;

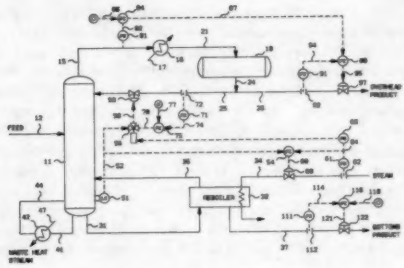
brake means on said hood car for automatically stopping the hood car movement when the hood car is uncoupled from the quenching car but for being released to permit movement of the hood car when the quenching car is coupled to the hood car, said brake means comprising (a) a stationary brake rail, (b) a pair of pivotally mounted brake jaws adapted to grip said brake rail, (c) brake compression springs urging said brake jaws to pivot toward each other and against said brake rail, (d) a hydraulic brake release cylinder-piston actuator connected to pivot said brake jaws away from each other, (e) a hydraulic brake control cylinder-piston actuator for activating said brake release cylinder-piston actuator and having an associated control piston rod adapted to be engaged by said driver element of said quenching car, and (f) a hydraulic brake control system for operating said brake release cylinder-piston actuator from said hydraulic brake control cylinder-piston actuator; the cylinder portion of said hydraulic brake release cylinder-piston actuator being connected to one of said brake jaws; said hydraulic brake release cylinder-piston actuator having an associated piston rod pivotally connected to the other of said brake jaws such that when said brake release cylinder-piston actuator is activated, the brake jaws are pivoted away from each other against the action of the brake compression springs and away from stationary brake rail; and

an emergency brake control consisting of a switching control means on said quenching car connected via the pressure medium through said hydraulic coupling control system to said driver element cylinder-piston actuator, said switching control means adapted to be activated by a stationary switching cam mounted at a selected position along the path of travel of said quenching car to operate said driver element cylinder-piston actuator to retract said driver element out of said hood car coupling opening.

4,377,443
CONTROL OF A FRACTIONAL DISTILLATION PROCESS

Lee Tuck, Lake Jackson, and Frank W. Skraba, Sweeny, both of Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 5, 1982, Ser. No. 365,202
Int. Cl.³ B01D 3/42
U.S. Cl. 203—1 **10 Claims**



1. Apparatus comprising:

a fractional distillation column;

means for passing a feed stream into said fractional distillation column;

means for withdrawing an overhead vapor stream from an upper portion of said fractional distillation column;

means for condensing at least a portion of said overhead vapor stream;

an accumulator;

means for passing the resulting at least partially condensed overhead stream into said accumulator;

means for withdrawing condensate from said accumulator, for passing a first portion of the thus withdrawn condensate into an upper portion of said fractional distillation column as an external reflux therefor and for passing a second portion of the thus withdrawn condensate as an overhead product stream;

means for withdrawing a bottoms product stream from a lower portion of said fractional distillation column;

means for supplying heat from a heating fluid stream to said fractional distillation column, wherein the heat supplied from said heating fluid stream is controllable;

means for supplying heat from a waste heat stream to said fractional distillation column, wherein the heat supplied from said waste heat stream is not controllable;

means for establishing a first signal which is responsive to the liquid level in the bottom of said fractional distillation column;

means for manipulating the heat supplied by said heating fluid stream in response to said first signal, if the amount of heat supplied by said waste heat stream to said fractional distillation column is not sufficient to supply all heat

needed by said fractional distillation column, to thereby maintain a desired liquid level in the bottom of said fractional distillation column; and

means for manipulating the flow rate of said external reflux in response to said first signal only if no heat is being supplied to said fractional distillation column by said heating fluid stream to thereby maintain a desired liquid level in the bottom of said fractional distillation column.

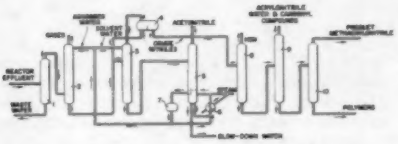
4,377,444
RECOVERY AND PURIFICATION OF OLEFINIC NITRILES

Hsin C. Wu, Parma, Ohio, assignor to The Standard Oil Co., Cleveland, Ohio

Continuation-in-part of Ser. No. 446,557, Feb. 27, 1979, abandoned, which is a continuation of Ser. No. 185,721, Oct. 1, 1971, abandoned, which is a continuation-in-part of Ser. No. 29,022, Apr. 16, 1970, abandoned. This application Jan. 13, 1975, Ser. No. 535,402

Int. Cl.³ B01D *3/34*

U.S. Cl. 203—96 **6 Claims**



1. In the process for the recovery of an olefinic nitrile from a mixture of said olefinic nitrile and other olefinic nitriles, hydrogen cyanide, acetonitrile, and carbonyl compounds, said mixture being produced by the ammoxidation of an olefin, the improvement comprising

(a) feeding to an extractive distillation column equipped with several fractionating trays at a point above the middle of the extractive distillation column a mixture of the olefinic nitrile, hydrogen cyanide, acetonitrile, and carbonyl compounds,

(b) feeding solvent water to the extractive distillation column at a temperature in the range of 60° F. to 120° F., and

(c) removing a vapor sidestream at a point below the middle of the extractive distillation column, and removing from said sidestream substantially all of the hydrogen cyanide, acetonitrile and carbonyl compounds.

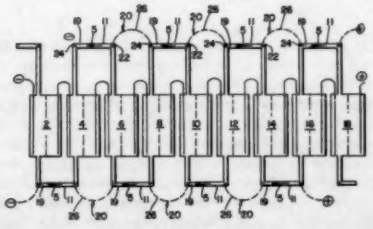
4,377,445
SHUNT CURRENT ELIMINATION FOR SERIES CONNECTED CELLS

Patrick G. Grimes, Westfield, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Nov. 7, 1980, Ser. No. 204,852

Int. Cl.³ C25B *15/06, 15/08;* H01M *8/04, 6/30*

U.S. Cl. 204—1 R **41 Claims**



1. A method of minimizing shunt currents in an electrochemical device having a plurality of cells connected at least in part electrically and at least in part hydraulically in series, adjacent series cells of said device sharing electrolyte in respective hydraulically connected intercell conduits whereby electrical electrolytic conductive shunt current pathways are created in said electrolyte of said respective intercell conduits, said method comprising the steps of:

(a) forming an electrical bypass across at least two adjacent intercell conduits; and

(b) applying a protective current across said electrical bypass in a direction which is the same as the shunt currents through the intercell conduits and of a magnitude which can effectively reduce said shunt currents.

4,377,446
CARBON DIOXIDE MEASUREMENT

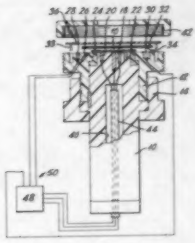
Wyndham J. Albery, London, England, assignor to National Research Development Corporation, London, England

Filed Apr. 15, 1982, Ser. No. 368,812

Claims priority, application United Kingdom, Apr. 30, 1981, 8113365

Int. Cl.³ G01N *27/46*

U.S. Cl. 204—1 T **6 Claims**



1. Apparatus for sensing the presence of carbon dioxide in a fluid which may contain oxygen comprises in series array:

a first layer of high polymeric material which is permeable to carbon dioxide and oxygen, and which has in contact with one surface a porous layer of metal which constitutes a first working electrode;

in contact with said first working electrode a layer of an aqueous electrolyte;

a second layer of high polymeric material which is permeable to carbon dioxide;

in contact with said second layer a layer of a non-aqueous solvent;

a second working electrode in contact with the non-aqueous solvent;

and circuit means arranged to hold the first working electrode at a potential such that oxygen but not carbon dioxide is reduced in the aqueous electrolyte, to hold the second working electrode at a potential such that carbon dioxide is reduced in the non-aqueous solvent, and to sense any current flowing through the second working electrode.

4,377,447
METHOD FOR GRAINING METAL LITHOGRAPHIC PLATE

Joseph F. Bednarz, 287 Euclid Ave., Hackensack, N.J. 07601

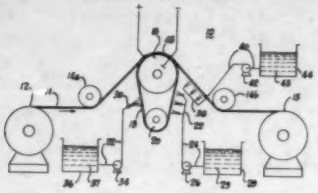
Filed Apr. 20, 1981, Ser. No. 255,798

Int. Cl.³ C25D *11/04;* C25F *3/04*

U.S. Cl. 204—15 **17 Claims**

1. A method useful for graining aluminum strip for use as lithographic plate comprising the steps of bringing the strip and a cloth fabric into rubbing contact over a metal backing member while applying an aqueous chloride salt solution to the surface of the strip; moving the strip and the fabric relative to

each other while in contact to remove reaction products from the strip surface and expose fresh surface area to the solution;



and, establishing an electrical potential between the backing member as the cathode and the strip as the anode.

4,377,448

ELECTROLYTIC GOLD PLATING

Paul A. Kohl, Chatham, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 108,964, Dec. 31, 1979, Pat. No. 4,310,392.
This application Oct. 2, 1981, Ser. No. 308,231
Int. Cl.³ C25D 3/48
U.S. Cl. 204—46 G 6 Claims

1. A process for electroplating metallic substances consisting essentially of gold comprising the step of passing current through an anode, aqueous plating solution and cathode characterized in that the plating bath comprises an heterocyclic additive consisting essentially of phenolphthalein.

4,377,449

ELECTROLYTIC SILVER PLATING

Paul A. Kohl, Chatham, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 108,964, Dec. 31, 1979, Pat. No. 4,310,392.
This application Oct. 19, 1981, Ser. No. 312,891
Int. Cl.³ C25D 3/46
U.S. Cl. 204—46 R 6 Claims

1. A process for electroplating metallic substances consisting essentially of silver comprising the step of passing current through an anode, aqueous plating solution and cathode characterized in that the plating bath comprises an heterocyclic additive consisting essentially of phenolphthalein.

4,377,450

PALLADIUM ELECTROPLATING PROCEDURE

Yutaka Okinaka, Madison, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 15, 1982, Ser. No. 368,568
Int. Cl.³ C25D 3/50, 3/52
U.S. Cl. 204—46 R 18 Claims

1. A process for electroplating a metallic substance on a surface, said metallic substance comprising palladium, comprising the step of passing current through a cathode, an electroplating bath and an anode with cathode potential great enough to electroplate pailadium and said electrochemical bath having a conductivity greater than 10^{-3} mho-cm characterized in that the electroplating bath is replenished by the addition of palladium hydroxide made by the oxidation of palladium diammine dichloride by hypochlorite ion in an alkaline aqueous solution.

4,377,451

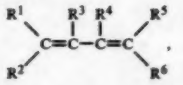
ELECTROCHEMICAL CONVERSION OF CONJUGATED DIENES INTO ALKADIENEDIOIC ACIDS

Wilhelmus J. M. van Tilborg, and Cornelis J. Smit, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 10, 1981, Ser. No. 233,264
Claims priority, application United Kingdom, Feb. 19, 1980, 8005543
Int. Cl.³ C25B 3/00, 3/10
U.S. Cl. 204—59 R 10 Claims

1. A process for the preparation of alkadienedioic acids which comprises steps for

(a) subjecting a carbon dioxide reactant and a conjugated diene reactant to electrolysis in the presence of an essentially anhydrous aprotic electrolysis solvent and an electrolyte, said diene reactant consisting essentially of compounds of the formula:



wherein R^1, R^2, R^3, R^4, R^5, and R^6 each individually represents a hydrogen atom or an optionally substituted alkyl, aryl, alkaryl or aralkyl group having up to 12 carbon atoms, to produce an electrolysis product mixture, and

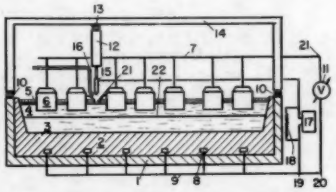
(b) recovering alkadienedioic acids from the product mixture.

4,377,452

PROCESS AND APPARATUS FOR CONTROLLING THE SUPPLY OF ALUMINA TO A CELL FOR THE PRODUCTION OF ALUMINUM BY ELECTROLYSIS

Spyridon Casdas, Paralia-Distomon, Greece, assignor to Aluminium de Grece, Athens, Greece

Filed May 27, 1981, Ser. No. 267,597
Claims priority, application France, Jun. 6, 1980, 80 13029
Int. Cl.³ C25C 3/06
U.S. Cl. 204—67 9 Claims



1. In a process for controlling the supply of alumina to a cell for the production of aluminum by electrolysis of alumina dissolved in molten cryolite electrolyte, including providing storage, measurement and transfer of alumina to at least one alumina supply orifice which is held open in the crust which is formed at the surface of the electrolyte and into which a movable plunger can penetrate, and wherein the plunger is moved with a substantially vertical alternating upward and downward movement, the improvement comprising in each downward movement the detecting whether the plunger has come into contact with molten electrolyte or with solidified electrolyte, said detection being effected by measuring the electrical voltage between the plunger and a point of the cell which is taken as reference potential.

4,377,453

ELECTROCHEMICAL SYNTHESIS AND PRODUCT

Alan Bewick; John M. Mellor, both of Southampton, England, and Bobby S. Pons, Pontiac, Mich., assignors to National Research Development Corporation, London, England

PCT No. PCT/GB79/00029, § 371 Date Aug. 13, 1979, § 102(e) Date Aug. 13, 1979, PCT Pub. No. WO79/00613, PCT Pub. Date Sep. 6, 1979

PCT Filed Feb. 9, 1979, Ser. No. 217,323

Int. Cl.³ C25B 3/02

U.S. Cl. 204—78 6 Claims

1. A method of performing a liquid-phase electrochemical reaction, characterized by the presence, in an electrolyte compartment, of a solid particulate trapping agent separable from the liquid, which particulate trapping agent has a functional group capable of bonding a charged species produced at one electrode, causing the charged species not to be further electrolyzed, after sufficient electrochemical reaction separating the solid particulate trapping agent from the liquid, and regenerating said solid particulate trapping agent to liberate a product derived from said charged species.

4,377,454

NOBLE METAL-COATED CATHODE

Tilak V. Bommaraju, Grand Island, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation of Ser. No. 148,320, May 9, 1980. This application Mar. 8, 1982, Ser. No. 344,468

Int. Cl.³ C25B 1/24, 1/26

U.S. Cl. 204—95 4 Claims

1. In a process for producing an alkali metal halate by electrolyzing an alkali metal halide solution in an electrolytic cell having at least one anode and cathode, the improvement which comprises utilizing as said cathode a low overvoltage hydrogen cathode comprising a conductive substrate, an intermediate protective layer selected from the group consisting of silver, cadmium, chromium and tungsten applied to the conductive substrate, and a porous noble metal coating deposited onto at least a portion of the surface of said intermediate protective layer, a major portion of said noble metal layer comprising platinum, and a minor portion of said noble metal layer comprising a second noble metal selected from the group consisting of rhodium, palladium, iridium, and osmium.

4,377,455

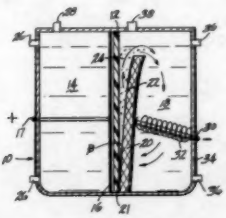
V-SHAPED SANDWICH-TYPE CELL WITH RETICULATE ELECTODES

Igor V. Kadija, and Kenneth E. Woodard, Jr., both of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Jul. 22, 1981, Ser. No. 285,724

Int. Cl.³ C25B 1/34, 9/00

U.S. Cl. 204—98 16 Claims



1. An electrolytic cell for the electrolysis of aqueous solutions to produce gaseous products which comprises a housing, a separator traversing said housing to form an anode compartment and a cathode compartment, an anode in said anode compartment adjacent to said separator, a cathode in said cathode compartment adjacent to said separator, means for introducing an electrolyte into and removing said electrolyte from said anode compartment, an outlet for gaseous products in said anode compartment, means for introducing a liquid into and removing a liquid from said cathode compartment, an outlet for gaseous products in said cathode compartment, means for supplying electrical current to said anode and said cathode, at least one of said anode and said cathode comprising a porous electrode having a porosity in the range of from about 30 to about 98 percent, said porous electrode having a first portion in direct contact with said separator and a second portion spaced apart by an angle of inclination from said separator, said second portion being closer to said outlets for gaseous products than said first portion.

4,377,456

PROCESS AND APPARATUS FOR TREATING PHOTOGRAPHIC FIXING BATHS

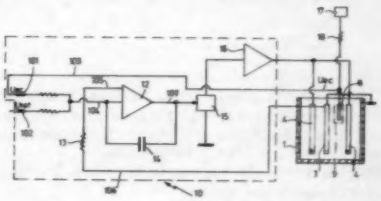
Philippe A. DeMeester, Rixensart; Jean-Pierre J. Heraly, and Pierre F. Vandenput, both of Lasne, all of Belgium, assignors to Estorol A.G., Basel, Switzerland

Filed Feb. 23, 1981, Ser. No. 237,413

Claims priority, application Luxembourg, Feb. 21, 1980, 82188

Int. Cl.³ C25B 15/02; C25C 1/22

U.S. Cl. 204—109 10 Claims



1. A process for treating a photographic fixing bath in order to remove therefrom silver in a metallic form, comprising stirring a photographic fixing bath, electrolyzing said bath so as to cause metallic silver to be deposited onto at least one cathode placed between anodes, regulating the current intensity in said bath by a control electrode of pure carbon placed near the cathode, in which the electrolysis current intensity is regulated due to variations encountered such as due to the silver concentration and temperature, said regulating being effected by measuring a potential difference between a cathode used as working electrode and the control electrode and by appropriately adjusting said electrolysis current intensity, as needed, in response to said measured potential difference.

4,377,457

DUAL CURE COATING COMPOSITIONS

Rudolph H. Boeckeler, Grafton, and James R. Prom, Port Washington, both of Wis., assignors to Freeman Chemical Corporation, Port Washington, Wis.

Filed Nov. 21, 1980, Ser. No. 208,856

Int. Cl.³ C08F 8/18; C08G 18/00, 2/02

U.S. Cl. 204—159.16 5 Claims

1. A coating composition comprising:

a first resin containing plural beta hydroxyl alkyl acrylate groups;

a second resin consisting of an aminoplast resin;

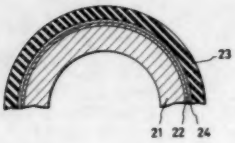
a photopolymerization initiator for said first resin, said initiator being selected from those initiators which decompose upon exposure to UV radiation to generate an acid catalyst for the cross-linking reaction of said aminoplast resin and the hydroxy groups of said first resin.

4,377,458

ULTRAVIOLET-CURING COMPOSITION, PREPREG SHEET CONTAINING THE SAME, AND METALLIC MATERIAL HAVING ANTICORROSIVE COATING

Hideo Watanabe, Yugawaramachi, Japan, assignor to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Dec. 24, 1980, Ser. No. 219,935
Claims priority, application Japan, Dec. 26, 1979, 54-169907
Int. Cl.³ C08F 8/00
U.S. Cl. 204—159.16 7 Claims



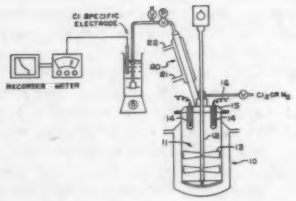
1. An ultraviolet-curing composition comprising an ultraviolet-curing resin having active OH group or COOH group, a vinyl monomer, a thickening agent which is reactive with the active OH group or COOH group of the ultraviolet-curing resin, and a photosensitizer.

4,377,459

PROCESS FOR CHLORINATION OF POLY(VINYL CHLORIDE) WITH LIQUID CHLORINE, AND CHLORINATED POLY(VINYL CHLORIDE) COMPOSITION

Richard G. Parker, Hudson, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Aug. 14, 1980, Ser. No. 177,969
Int. Cl.³ C08F 2/46, 8/22, 12/18; C08J 3/28
U.S. Cl. 204—159.18 20 Claims



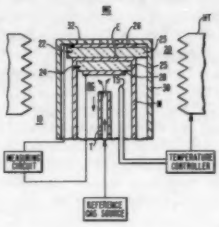
1. A process for chlorinating a mass of freely flowable solid, discrete, poly(vinyl chloride) macrogranules, comprising, contacting said mass with from about 0.1 part to about 3 parts by weight of liquid chlorine per part by weight of said mass, at a temperature in the range from about −50° C. to about 50° C.; absorbing said liquid chlorine in said poly(vinyl chloride) macrogranules to produce liquid chlorine-containing macrogranules; agitating said liquid chlorine-containing macrogranules to maintain a reaction zone in which said mass is a free-flowing mass; irradiating said free-flowing mass of liquid chlorine-containing macrogranules with actinic radiation for a period of time sufficient for a reaction of said liquid chlorine in a solid medium, which reaction chemically bonds at least 59% by weight of chlorine with said poly(vinyl chloride) which is thus converted to chlorinated poly(vinyl chloride); removing hydrogen chloride from said reaction zone; and, recovering a free-flowing mass of macrogranules of said chlorinated poly(-vinyl chloride).

4,377,460

SOLID ELECTROLYTE GAS SENSING APPARATUS

Chikara Hirayama, Murrysville Boro, and Ching-Yu Lin, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 19, 1981, Ser. No. 312,552
Int. Cl.³ G01N 27/46
U.S. Cl. 204—195 S 5 Claims



1. A gas analyzer apparatus for measuring gases of a monitored gas environment which contain anhydrides or related compounds in air or in oxygen-bearing gases by generating an electrical signal on the basis of a difference in the partial pressure of a gas species between the monitored gas environment and a reference gas environment, comprising,

a solid electrolyte electrochemical concentration cell assembly including first and second identical half cells, each half cell consisting of an alkali ion conductive electrolyte element and an electrode disposed on a surface thereof, and

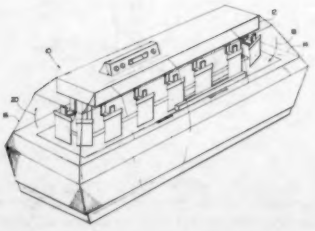
a solid membrane means of a composition exhibiting alkali ion conductivity corresponding to the alkali ion conductivity of said half cells, the surface of said first half cell opposite the electrode being in contact with a first surface of said membrane means, the surface of said second half cell opposite the electrode being in contact with an opposite surface of said membrane means, said monitored gas environment contacting said first half cell and said reference gas environment contacting the second half cell, said solid membrane means isolating said monitored gas environment from said reference environment while supporting the alkali ion conductivity of the concentration cell assembly.

4,377,461

TAB PLATER FOR CIRCUIT BOARDS OR THE LIKE

Curtis N. Lovejoy, Bristol, Conn., assignor to Napco, Inc., Terryville, Conn.

Filed Sep. 23, 1981, Ser. No. 305,023
Int. Cl.³ C25D 17/00, 17/06, 17/28
U.S. Cl. 204—198 10 Claims



1. In a plating machine which includes a frame for supporting the various rinsing and plating tanks required for treating

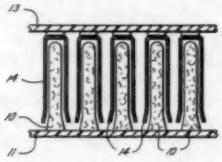
and plating depending portions of planar workpieces, the improvement comprising a workpiece transport conveyor chain supported in a superstructure portion of said frame for movement around a closed path, trolleys mounted to spaced locations on said chain, a trolley track adjacent said chain, each trolley having upper and lower rollers engaging said trolley track, workpiece holder means mounted to said trolley and including a vertically oriented work arm, a workpiece carrier adjustably mounted on said work arm and including means for clamping an upper marginal edge of a workpiece so that a depending portion of the workpiece follows a predetermined path located in predetermined relationship to said closed path of said conveyor chain means for connecting said workpiece carrier to a source of electrical potential, said connecting means including a bus bar mounted to the machine frame superstructure portion adjacent a portion of said closed conveyor chain path and a cantilevered electrical pick-up assembly mounted to said trolley and including a free end adapted to engage said bus bar and a clamped end adapted to be connected to said workpiece holder means, said trolley being constructed in two parts, one trolley part having said rollers and being so mounted to said chain, said trolley having another part electrically insulated from said one part and supporting said holder means.

4,377,462

TUNING FORK SHAPED ANODES FOR ELECTROLYSIS CELLS

Richard F. Baker, and Otis C. Taylor, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 12, 1981, Ser. No. 224,364
Int. Cl.³ C25B *11/02, 13/06, 13/08*
U.S. Cl. 204—253 **9 Claims**



1. In a brine electrolysis cell containing a plurality of spaced, vertically oriented anodes and cathodes whose working faces are flat and substantially parallel to each other, said anodes being attached at one edge to an anode base and said cathodes being attached to a cathode base, the improvement which comprises:

anodes which are C- or U-shaped and which are each directly attached to the anode base at the base of their C- or U-shape in such a fashion so that each one of them fit around a corresponding cathode pocket instead of fitting between them, and wherein the leading edges of the anode working faces are bent outwardly away from the anode interior.

4,377,463

CONTROLLED ATMOSPHERE PROCESSING OF TiB_2/CARBON COMPOSITES

Louis A. Joo, Johnson City; Kenneth W. Tucker, Elizabethton, and Scott D. Webb, Watauga, all of Tenn., assignors to Great Lakes Carbon Corporation, New York, N.Y.

Filed Jul. 27, 1981, Ser. No. 287,127
Int. Cl.³ C25C *3/06, 7/02*; C01B *35/04*
U.S. Cl. 204—294 **8 Claims**

7. In a process for the production of a cathodic component for a Hall cell comprising TiB_2 wherein said component is heated to a temperature of 2000° C. or higher, the improvement comprising the use of a nitrogen atmosphere when heating said component up to about 2100° C., and the use of an argon atmosphere when heating said component at temperatures rising to above 2100° C.

4,377,464

COAL LIQUEFACTION PROCESS

Norman L. Carr, Allison Park; William G. Moon, Cheswick, and Michael E. Prudich, Pittsburgh, all of Pa., assignors to The Pittsburg & Midway Coal Mining Co., Englewood, Colo.

Filed Sep. 3, 1981, Ser. No. 298,642
Int. Cl.³ C10G *1/00, 1/06*
U.S. Cl. 208—8 LE **10 Claims**

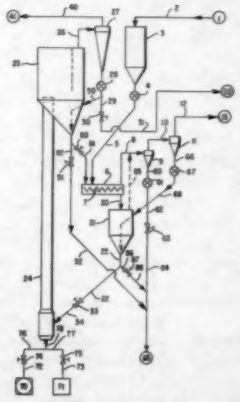
1. A coal liquefaction process for producing a C_5-900° F. liquid yield greater than 50 weight percent MAF coal, which comprises passing hydrogen and a feed slurry comprising mineral-containing feed coal, recycle normally solid dissolved coal, recycle mineral residue and a recycle liquid solvent to a coal liquefaction zone, recycle ash being present in said feed slurry in an amount greater than about 8 weight percent based on the total feed slurry, said feed slurry containing from 20–35 wt. percent coal, said feed slurry being reacted in said coal liquefaction zone under a hydrogen partial pressure of from about 2,100 and about 4,000 psi at a temperature in the range of 430°–470° C., under threephase, backmixed, continuous flow conditions at a nominal slurry residence time of from about 1.2 to about 2 hours, the values for said recycle ash, hydrogen partial pressure and slurry residence time being selected to produce a C_5-900° F. liquid yield of between about 50 to about 70 weight percent based upon MAF coal.

4,377,465

OIL SHALE RETORTING METHOD AND APPARATUS

Earl D. York, Englewood, Colo., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 19, 1980, Ser. No. 208,164
Int. Cl.³ C10G *1/00*
U.S. Cl. 208—11 R **12 Claims**



1. An improved method for processing oil shale, comprising the steps of:

retorting raw oil shale by contacting said raw oil shale in a retort with a solid heat transfer medium consisting essentially of spent oil shale at a sufficient temperature to liberate hydrocarbons including shale oil from said raw oil shale leaving retorted oil shale containing carbonaceous material;

passing said retorted oil shale containing carbonaceous material to a generally vertical lift pipe defining a combustion zone spaced away from and located outside of said retort;

injecting an oxidizing gas comprising oxygen and steam into

said vertical lift pipe to substantially combust said carbonaceous material on said retorted shale forming spent oil shale having improved cementation properties, said oxidizing gas being injected into said vertical lift pipe at a sufficient velocity to lift said spent oil shale upwardly through said lift pipe into a collecting bin;

feeding a portion of said spent oil shale from said collecting bin to said retort for use as said solid heat transfer medium;

feeding said raw oil shale only to said retort

removing another portion of said spent oil shale from said collecting bin; and

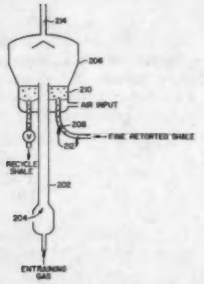
forming a cementatious slurry by adding a sufficient amount of water to said removed spent oil shale.

4,377,466

PROCESS FOR STAGED COMBUSTION OF RETORTED CARBON CONTAINING SOLIDS

Per H. Wallman, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 27, 1981, Ser. No. 257,700
Int. Cl.³ C10G *1/00*; C10B *49/10*
U.S. Cl. 208—11 R **9 Claims**



1. In a process for retorting a carbon containing solid in a retorting zone using a heat carrier material heated by burning particulate retorted carbon containing solids containing residual carbonaceous material which comprises:

(a) introducing a first fraction of retorted carbon containing solid from the retorting zone into the bottom of a vertical combustion zone characterized by an upwardly flowing gas stream containing oxygen and having a velocity sufficient to raise the particles of carbon containing solid to the top of the combustion zone, whereby the particles are pneumatically entrained and carried upward by the gas stream;

(b) burning at least part of the carbonaceous residue in said first fraction of retorted carbon containing solid during its passage from the bottom to the top of said vertical combustion zone;

(c) burning the remaining carbonaceous residue in said first fraction in a fluidized bed containing an atmosphere having at least a stoichiometric amount of oxygen present;

(d) introducing a second fraction of retorted carbon containing solid directly into the fluidized bed and burning the carbonaceous residue therein, said second fraction being of a generally smaller particle size than said first fraction; and

(e) recovering burned solids from the fluidized bed.

4,377,467

SOLVENT DEWAXING WAXY HYDROCARBON OILS USING DEWAXING AID

Biddanda U. Achia, Sarnia, Canada, assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jan. 30, 1981, Ser. No. 229,664
Int. Cl.³ C10G *73/06, 73/08*
U.S. Cl. 208—33 **12 Claims**

1. A solvent dewaxing process comprising mixing a waxy hydrocarbon oil with dewaxing solvent and a dewaxing aid comprising a mixture of (a) lithium isostearate and (b) an acrylic ester polymer, which polymer has a number average molecular weight ranging from about 300,000 to 2,000,000 and which polymer is an ester of at least one aliphatic C_6–C_{30} alcohol, and chilling said oil, dewaxing solvent, and dewaxing aid mixture to form a slurry comprising solid particles of wax and a solution of dewaxed oil and dewaxing solvent and separating said wax from said dewaxed oil solution.

4,377,468

SULFUR- AND NITROGEN-CONTAINING HYDROCARBON FEED HYDROCRACKING OVER ZSM-20

Rene B. La Pierre, Morrisville, and Robert L. Gorring, Washington Crossing, both of Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 5,066, Jan. 22, 1979, abandoned. This application Sep. 18, 1981, Ser. No. 303,334
Int. Cl.³ C10G *47/18*
U.S. Cl. 208—111 **9 Claims**

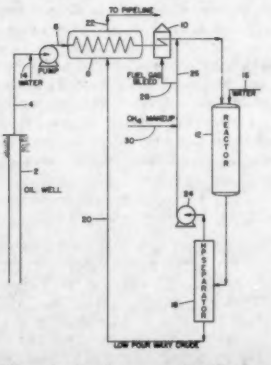
1. A process for effecting catalytic hydrocracking at low pressure of a hydrocarbon charge containing sulfur- and nitrogen-containing organic compounds which comprises contacting a mixture of said charge and hydrogen with a catalyst comprising a Group VIII metal-containing synthetic crystalline zeolite ZSM-20 said Group VIII metal being present in an amount between about 0.1 and 10.0%.

4,377,469

MAINTAINING CATALYTIC ACTIVITY OF SODIUM ALUMINOSILICATES

David S. Shihabi, Pennington, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 30, 1981, Ser. No. 307,055
Int. Cl.³ C10G *11/05, 47/16*
U.S. Cl. 208—111 **13 Claims**



1. A process for reducing the pour point of a was containing mineral oil to a predetermined value which comprises:

contacting a mixture of said mineral oil and added water or a water precursor with a catalyst having an alpha value less than about 10, in the presence or absence of added gas,

under conversion conditions effective to reduce the pour point of said oil to said predetermined value,

said catalyst having been prepared from a composition comprising a precursor crystalline aluminosilicate having a silica-alumina ratio greater than 12, a constraint index between about 1 and about 12 and an alpha value greater than about 20, said preparation including steaming said precursor to reduce its alpha value to not less than about 10 and ion-exchanging said steamed precursor with an alkali metal cation under conditions effective to further reduce its alpha value to less than about 10,

said water or said water precursor being present in an amount effective to reduce the conversion temperature required to effect the reduction of the pour point of said mineral oil to said predetermined value in the absence of said water or said water precursor.

4,377,470

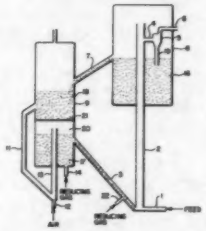
IMMOBILIZATION OF VANADIA DEPOSITED ON CATALYTIC MATERIALS DURING CARBO-METALLIC OIL CONVERSION

William P. Hettinger, Jr., Russell; James D. Carruthers, Catlettsburg, both of Ky., and William D. Watkins, Huntington, W. Va., assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 255,398, Apr. 20, 1981. This application Apr. 28, 1981, Ser. No. 258,265

Int. Cl.³ C10G *11/04*

U.S. Cl. 208—120 **41 Claims**



40. A process for converting a hydrocarbon feed containing at least about 1 ppm vanadium to lighter products comprising:

contacting said hydrocarbon feed with a cracking catalyst having a relative activity of at least about 20% and containing at least about 5000 ppm vanadium and less than about 0.15 percent carbon, said contact being made in a progressive flow reactor for a predetermined vapor riser residence time in the range of about 0.5 to about 10 seconds at a temperature of about 900 to about 1400° F. and under a pressure of about 10 to about 50 pounds per square inch absolute while causing a conversion per pass in the range of about 50 to about 90% while producing coke and laying down vanadium in an oxidation state less than +5 and coke on said catalyst;

separating spent catalyst from the hydrocarbon products formed in said reactor;

contacting said spent catalyst at a temperature of at least about 1275° F. with an oxygen-containing gas in at least two stages, in the first stage of which said spent catalyst comprises a fluidized bed having a density from about 25 to about 50 pounds per cubic foot, the average residence time of said catalyst in said bed is from about 5 to about 30 minutes, and said oxygen-containing gas is sufficiently deficient in oxygen to produce CO and CO_2 in the gases in heat exchange contact with the catalyst in a CO/CO_2 ratio of at least about 0.25; transferring the partially regenerated catalyst to a riser regenerator wherein the partially regenerated catalyst as a dilute phase of solids and at a temperature greater than about 1275° F. is contacted with a stoichiometric excess of oxygen for a period of time less than about 2 seconds so as to reduce the carbon concentration on said catalyst to less than about 0.15 percent by weight;

separating the resulting regenerated catalyst from the oxygen containing gases;

collecting the separated regenerated catalyst in the presence of a reducing gas; and

recycling the regenerated catalyst containing at least about 5000 ppm vanadium by weight to the progressive flow reactor for contact with fresh feed.

4,377,471

METHOD FOR REMOVING POLYCHLORINATED BIPHENYLS FROM TRANSFORMER OIL

John F. Brown, and Marie E. Lynch, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 3, 1980, Ser. No. 212,387

Int. Cl.³ C10G *45/02, 19/00, 19/073*; C07C *1/26*

U.S. Cl. 208—262 **6 Claims**

1. A method for effecting the removal of polychlorinated biphenyls from contaminated transformer oil having up to 1% by weight of polychlorinated biphenyl, and less 60 ppm of water which comprises

(1) directly adding to the transformer oil under an inert atmosphere, while it is being agitated, finely divided sodium metal, an oil soluble electron carrier selected from the class consisting of benzophenone, alkylated benzophenone, naphthylene, alkyl naphthylene, biphenyl and alkyl biphenyl, and an aprotic complexing solvent selected from the class consisting of tetrahydrofuran, ethyleneglycoldimethylether, diethyleneglycoldimethylether, oligomeric ethyleneglycoldialkylether, dimethylformamide and hexamethylphosphoramide, and

(2) continuing the agitation of the resulting mixture until the polychlorinated biphenyl content of the resulting mixture is reduced to less than 50 ppm,

where the aforementioned ingredients of (1) are utilized in proportions sufficient to produce a mixture having an initial concentration of 0.1–2% of the finely divided sodium metal, 0.1 to 1% of oil soluble electron, and 1–10% of the aprotic complexing solvent, based on the weight of the mixture.

4,377,472

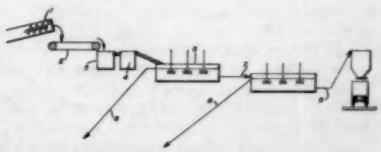
PHOSPHATE FLOTATION

Howard L. Allen, Lithia, Fla., assignor to W. R. Grace & Co., New York, N.Y.

Continuation of Ser. No. 711,287, Aug. 3, 1976, abandoned. This application Nov. 1, 1978, Ser. No. 956,701

Int. Cl.³ B03D *1/14*

U.S. Cl. 209—166 **13 Claims**



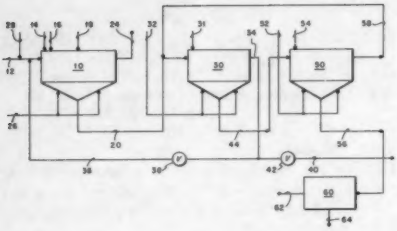
1. The method of reverse flotation for silica-containing phosphate rock ore, comprising adding potato or corn starch to the ore to depress phosphate rock particles, followed by adding cationic reagent to float the silica, and recovering phosphate rock as sink concentrate and silica as float tailings.

4,377,473

METHOD FOR CONCENTRATING THE EXINITE GROUP MACERALS FROM COAL BY FROTH FLOTATION

Timothy J. Lares, Price, Utah, and Richard D. Pick, Englewood, Colo., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 16, 1981, Ser. No. 283,755
Int. Cl.³ B03D 1/14
U.S. Cl. 209—167 9 Claims



1. A method for separating coal and a resin concentrate from an aqueous slurry containing resin solids, finely divided coal solids and finely divided inorganic solids, said method consisting essentially of:

(a) adjusting the concentration of said slurry to from about 3 to about 15 weight percent solids;

(b) admixing from about 25 to about 50 mg of a first froth flotation agent selected from the group consisting of short chain alcohol frothing agents containing from about 6 to 8 carbon atoms and from about 2 to about 10 mg of a second froth flotation agent selected from the group consisting of polyglycol-type frothers per kilogram of said solids in said slurry with said slurry to produce a mixture;

(c) admixing an additional quantity of from about 25 to about 50 mg of said first froth flotation agent per kilogram of said solids in said slurry with said mixture in a first froth flotation zone at an average residence time from about 3 to about 6 minutes after charging said mixture to said first froth flotation zone;

(d) subjecting said mixture to froth flotation in said first froth flotation zone for a total average residence time from about 8 to about 10 minutes to produce a resin and coal-rich stream and an inorganic solids rich stream;

(e) admixing up to about 5 mg of said first froth flotation agent per kilogram of said solids in said slurry with said resin and coal-rich stream to produce a second mixture;

(f) subjecting said second mixture to froth flotation in a second froth flotation zone for an average residence time from about 3 to about 6 minutes to produce a resin-rich stream and a first coal-rich stream;

(g) admixing up to about 5 mg of said first froth flotation agent per kilogram of said solids in said slurry with said resin-rich stream to produce a third mixture;

(h) subjecting said third mixture to froth flotation in a third froth flotation zone for an average residence time from about 1 to about 4 minutes to produce a resin concentrate stream and a second coal-rich stream;

(i) recycling said second coal-rich stream to said second froth flotation zone; and

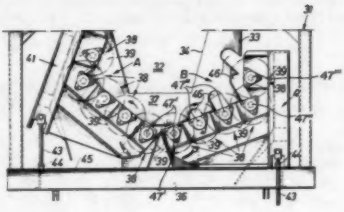
(j) producing a particulate resin concentrate from said resin concentrate stream.

4,377,474

APPARATUS FOR SEPARATING PARTICULATE OR LUMP MATERIAL BY SIZE

Gunnar B. Lindberg, Stockholm, Sweden, assignor to Rader Companies, Inc., Portland, Oreg.

Continuation of Ser. No. 142,147, Apr. 21, 1980, abandoned, which is a continuation-in-part of Ser. No. 68,546, Aug. 22, 1979, abandoned, which is a continuation of Ser. No. 954,843, Oct. 26, 1978, abandoned. This application Sep. 18, 1981, Ser. No. 303,481
Claims priority, application Sweden, Nov. 9, 1977, 7712674; Jan. 31, 1978, 7801161; Sep. 13, 1978, 7809646
Int. Cl.³ B07B 1/15
U.S. Cl. 209—279 4 Claims



1. Apparatus for the separation by size of particulate material such as wood chips, comprising

a plurality of parallel shafts arranged in two groups one on each of the opposite sides of a longitudinal central axis parallel to said shafts,

the axes of said shaft of each group lying substantially in a plane inclined at an acute angle upwardly from said axis,

each of said shafts having a plurality of discs fixedly mounted thereon, the discs on each shaft being interleaved with the discs on adjacent shafts,

means connected to said shafts for driving each group so that the discs thereon rotate in the direction away from said axis in the upper part of their rotation,

and means at one end of said apparatus for feeding particulate material to be sieved into said apparatus longitudinally of said central axis

whereby the rotating discs cause the particulate material to be thrown upwardly and outwardly and distributed over said discs, the material of a size less than the spacing between the intermeshed discs falling between said discs, the material larger than said spacing being moved toward and discharged from the opposite end of said apparatus.

4,377,475

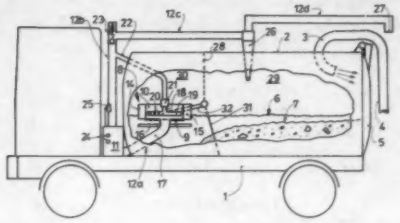
APPARATUS FOR SUCKING UP AND HOLDING SLUDGE

Karl Wiedemann, Haldenloh 2 B, 8901 Welden, Fed. Rep. of Germany

Filed Aug. 24, 1981, Ser. No. 295,355
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1980, 3034058
Int. Cl.³ B01D 21/26
U.S. Cl. 210—136 15 Claims

1. In an apparatus for sucking up and holding sludge, having a suction line opening into a sludge tank on a carriage having a sludge outlet with a sludge outlet door, and a water outlet able to be used separately therefrom, the water outlet having an overflow line with, at an inlet end thereof, a filter unit in the sludge tank, and at least one nozzle cleaning unit for jetting water onto the said filter unit, the invention residing in that said apparatus has a low pressure pump for putting said water outlet into operation, the overflow line running through said pump, the overflow line having an inlet placed at a higher level than said low pressure pump, and said pump having an inner inlet cross-section greater than the inner inlet cross-section of

a pump, designed for running with its inlet at atmospheric pressure but otherwise of equal size, in that the cross-section of the part of the overflow duct on the suction side is greater than



the inlet of a pump designed for running with its inlet at atmospheric pressure but otherwise of equal size, and in that the low pressure pump is joined up with the cleaning unit for pumping filtered water thereto.

4,377,476

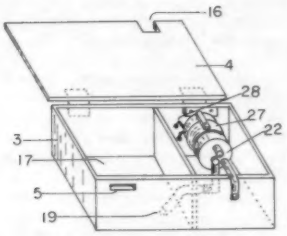
TISSUE FILTERING BATH FOR HISTOLOGY

Louis T. Ferrara, 2988- Ave. T, Brooklyn, N.Y. 11229

Filed Feb. 25, 1981, Ser. No. 237,681

Int. Cl.³ B01D *35/02*

U.S. Cl. 210—167 **8 Claims**



1. An integrated system for removing and filtering unwanted tissue and paraffin debris from a temperature controlled water bath used to float tissue specimens on the surface of the water in order to facilitate placing said tissue which are in the form of thin paraffin ribbon on a glass slide for subsequent staining of said tissue for microscopic examination; said system comprising in combination: A reservoir-container, compartmentalized means adjacent and affixed to said reservoir-container serving to house filter means, a pump means, a strainner means having essentially the same shape as said reservoir-container but sufficiently smaller so as to be recieved by said reservoir-container, said reservoir-container having on its wall an opening which communicates with the adjacent compartment which houses the filter means so that water placed within the reservoir-container eventially is filled to a predetermined level equal to water placed in the filter compartment; and that said opening be of such a size that sufficient water flows between the filter compartment and reservoir-container in the direction from reservoir-container to filter compartment and that the level of water in relation to the size of the opening be such that debris is able to flow or run off through the opening from said reservoir-container into the filter compartment thereby being trapped in filter means, said pump being arranged to circulate filtered water from said filter compartment to said reservoir-container.

4,377,477

APPARATUS FOR EQUALIZATION OF OVERFLOW WATER AND URBAN RUNOFF IN RECEIVING BODIES OF WATER

Karl R. Dunkers, Taby, Sweden, assignor to The Munters Corporation, Fort Myers, Fla.

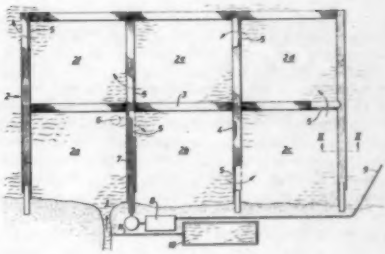
Continuation of Ser. No. 185,684, Sep. 10, 1980, Pat. No. 4,298,471, which is a continuation of Ser. No. 10,929, Feb. 9, 1979, abandoned. This application Jul. 13, 1981, Ser. No. 283,034

Claims priority, application Sweden, Mar. 2, 1978, 78023926

The portion of the term of this patent subsequent to Nov. 3, 1998, has been disclaimed.

Int. Cl.³ C02F *1/00;* **E02B** *13/00*

U.S. Cl. 210—170 **5 Claims**



1. An apparatus for equalizing the flow of polluted water comprising a tank including a plurality of sequentially fluid connected compartments arranged in a body of water, a first compartment of said plurality being in communication with an inlet discharging polluted water at a variable rate of flow, and a last compartment of said plurality being in fluid communication with said body of water such that water may flow either from said last compartment to said body of water or from said body of water into said last compartment, said tank being formed with generally vertical outer and intermediate walls, extending from the surface of said body of water to its bottom, which divide said tank into said plurality of compartments, said plurality of compartments being sequentially fluid connected by apertures provided in said intermediate walls and permitting fluid flow in both directions, a pump means in fluid communication with said first compartment and connected to an outlet conduit for withdrawing water from said first compartment at a substantially constant rate of flow, whereby when the rate of discharge of said polluted water into said first compartment exceeds the rate of withdrawal of water by said pump means, polluted water will sequentially displace water present in said compartments in a direction toward said body of water, while when the rate of discharge of polluted water into said first compartment is lower than the rate of withdrawal of water by said pump means, water from said body of water will enter said last compartment and sequentially displace polluted water in the opposite direction toward said first compartment.

4,377,478

SEPARATING ONE LIQUID FROM ANOTHER

George H. Rolls, Lymington; Andrew J. Beveridge, London; Ronald T. Challener, Dorset, all of England, and William Stuart, New York, N.Y., assignors to Star Offshore Services Limited, Aberdeen, Scotland and Oil Mop (UK) Limited, Dorset, England

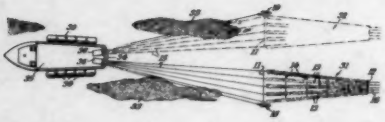
PCT No. PCT/GB79/00128, § 371 Date Mar. 31, 1980, § 102(e) Date Mar. 31, 1980, PCT Pub. No. WO80/00355, PCT Pub. Date Mar. 6, 1980

PCT Filed Jul. 31, 1979, Ser. No. 190,882

Claims priority, application United Kingdom, Jul. 31, 1978, 31680/78; Oct. 4, 1978, 39254/78

Int. Cl.³ E02B *13/04*

U.S. Cl. 210—242.3 12 Claims



1. Apparatus for removing oil from an oil-contaminated surface of a body of water comprising: a collapsible net; drive means at an oil collection station to advance the net in an advance movement from a storage disposition at an oil collection station at which the net is gathered to a floating disposition on the surface of the body of water in which the net is spread out to adsorb oil from the water, to withdraw the net from the floating disposition to the storage disposition in a return movement opposite to the advance movement during which the net is passed through desorbing means at the oil collection station to remove oil from the net and to subject the net repeatedly to the same advance and return movements between the storage disposition and the floating disposition for further adsorption of oil onto and removal of oil from the net and biasing means to spread out the net on the water in the floating disposition of the net.

4,377,479

VACUUM BELT FILTER

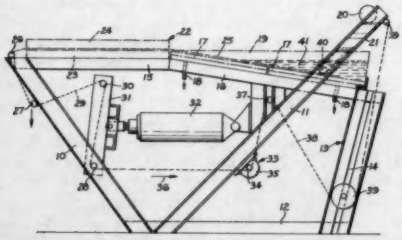
Henri G. W. Pierson, 98 London Rd., Bozeat, Wellingborough, Northamptonshire, England

Filed Dec. 3, 1981, Ser. No. 327,207

Claims priority, application United Kingdom, Feb. 18, 1981, 8105144

Int. Cl.³ B01D *33/04*

U.S. Cl. 210—350 11 Claims



1. In a vacuum belt filter mechanism for filtering a filtrate from a slurry the combination of: an endless filter belt movable unidirectionally through a forwardly advancing upper working run and a lower return run, drive means for driving the belt intermittently, guide means for guiding the belt through a feed section and a vacuum section of the upper working run, the belt in the vacuum section being upwardly inclined in the forward advancing direction of belt movement by an angle of from 4° to 20° to the horizontal, feed means for feeding the slurry onto the belt at the feed section, and vacuum means positioned below belt at the vacuum section and being operative for exerting a vacuum and draining the slurry through the belt leaving a filter cake residue deposited on the belt, the drive means being operative for belt advancement only when the vacuum means is non operative.

4,377,480

VACUUM BELT FILTER

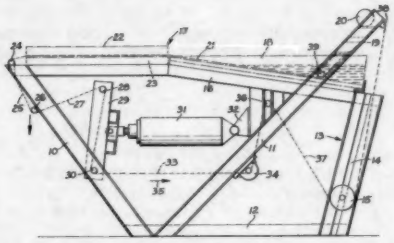
Henri G. W. Pierson, Wellingborough, England

Filed Dec. 3, 1981, Ser. No. 327,208

Claims priority, application United Kingdom, Feb. 18, 1981, 8105143

Int. Cl.³ B01D *33/04*

U.S. Cl. 210—350 7 Claims



1. A vacuum belt filter comprising: a unidirectional endless belt, drive means for intermittently driving the belt in the one direction, guide means for guiding the belt along a substantially horizontal upper run defining a rearward vacuum section and a forward compression section, supply means for charging a slurry to the upper belt surface at the vacuum section, a vacuum box disposed below the belt at the vacuum section, means for applying a vacuum to the vacuum box for dewatering the slurry and leaving a layer of a residual filter cake on the belt, a mechanical compression subassembly at the compression section through which the belt extends and including a stationary upper pressure plate disposed above the belt and having a nonstick surface facing downwardly toward the belt and a filter grid disposed below the belt and having an upper surface presented upwardly toward the belt and a downwardly-presented under surface and an inflatable membrane disposed below the filter grid adjacent the under surface and an inflation means for inflating the membrane into an upwardly pressing relationship with the filter grid and belt toward the upper pressure plate for compressing the filter cake.

4,377,481

BLENDED, POLYMERIC, MATRIX MEMBRANE AND PROCESS OF MAKING AND USING SAME

Stephen Z. Jakabhazy, Weston, Mass., assignor to Abcor, Inc., Wilmington, Mass.

Filed Nov. 14, 1980, Ser. No. 206,847

Int. Cl.³ B01D *31/00*

U.S. Cl. 210—500.2 40 Claims

23. A blended polymeric membrane, which membrane comprises:

(a) a vinylidene fluoride matrix polymer; and

(b) a copolymer compatible with and intimately blended with the matrix polymer, which copolymer is prepared by the copolymerization of a water-soluble, secondary or tertiary aminoethyl acrylate monomer and a water-insoluble acrylate or methacrylate monomer, wherein the weight percent of the copolymer, based on the membrane polymer, ranges from about 10% to 35% by weight, and

wherein the weight percent of the monomers of the copolymer ranges from about 20% to 80% by weight.

4,377,482

MOBILE PHASE FOR LIQUID CHROMATOGRAPHY

Jean E. F. Rivier, La Jolla, Calif., assignor to Salk Institute for Biological Studies, San Diego, Calif.

Filed Apr. 28, 1978, Ser. No. 901,117
Int. Cl.³ B01D 15/08
U.S. Cl. 210—635 13 Claims

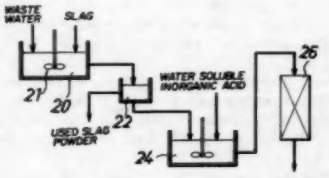
6. A method for resolving mixtures of peptides by reversed-phase high performance liquid chromatography comprising providing a column packed with hydrocarbonaceous functional groups bonded to a carrier, introducing a peptide mixture into the end of said column and eluting said column with a mobile phase comprising a mixture of a polar solvent selected from the group consisting of acetonitrile and methanol and an aqueous solution of a tertiary amine selected from the group consisting of trialkylammonium phosphate, trialkylammonium formate and N-alkyl morpholine wherein said alkyl moiety is selected from methyl, ethyl, propyl, butyl and mixtures thereof.

4,377,483

METHOD OF REMOVING DISSOLVED HEAVY METALS FROM AQUEOUS WASTE LIQUIDS

Kasane Yamashita, Kawasaki; Takao Ikehata, Yokosuka; Kazuhiko Tate, and Keisuke Nakahara, both of Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 168,569, Jul. 14, 1980, abandoned. This application Jul. 15, 1980, Ser. No. 169,220
Claims priority, application Japan, Jul. 13, 1979, 54-88300; Oct. 4, 1979, 54-127303; May 2, 1980, 55-57788
Int. Cl.³ C02F 1/28, 11/14
U.S. Cl. 210—670 19 Claims



1. A method for removing at least one dissolved metal selected from the group consisting of mercury and cadmium contained in an aqueous waste liquid which comprises the step of contacting particles of a steel-making converter slag with said waste liquid so as to absorb and fix said metal or metals on said slag particles, and separating said slag particles from said waste liquid, said steel making converter slag is converter furnace slag consisting essentially of 9–20 wt.% of SiO_2, 37–59 wt.% of CaO, 0.1–2.5 wt.% of Al_2O_3, 5–20 wt.% of FeO, 0.6–8.0 wt.% of MgO, 0.06–0.25 wt.% of S, 1.3–10.0 wt.% of MnO, 0.4–0.9 wt.% of TiO_2 and 1.5–2.3 wt.% of P_2O_5.

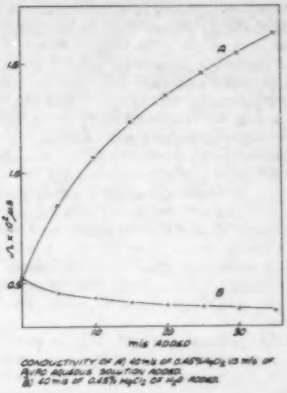
9. The method of claim 1 which further comprises the steps of separating said slag which has absorbed said dissolved metal or metals from said waste liquid and then heating said separated slag to recover said metal or metals.

4,377,484

METHOD OF CHELATING HEAVY METAL IONS

Elias T. Nasrallah, 12359 Faisine Dr., Creve Coeur, Mo. 63141

Filed Jan. 8, 1980, Ser. No. 110,402
Int. Cl.³ C02F 5/10
U.S. Cl. 210—698 4 Claims



CONDUCTIVITY OF A) 40 mls OF 0.45% H_3PO_4 IS mls OF PURE AQUEOUS SOLUTION ADDED. B) 40 mls OF 0.45% H_3PO_4 OF H_2O ADDED.

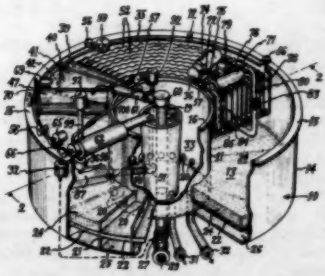
1. The method of chelating a heavy metal ion which comprises mixing an aqueous solution containing said ion with an aqueous solution of water soluble poly(2-vinyl pyridine-1-oxide), the concentration of the poly(2-vinyl pyridine-1-oxide) in the latter aqueous solution being at least 0.03% by weight, to form a water soluble polymer-metal complex which is stable in an acid medium down to a pH of about 2.

4,377,485

APPARATUS AND METHOD FOR CLARIFICATION OF WATER USING COMBINED FLOTATION AND FILTRATION PROCESSES

Milos Krofta, Lenox, Mass., assignor to Lenox Institute for Research, Inc., Lenox, Mass.

Filed Sep. 15, 1981, Ser. No. 302,566
Int. Cl.³ B01D 21/01, 21/08
U.S. Cl. 210—704 9 Claims



1. An apparatus for purifying unclarified water of the type including a cylindrically shaped tank having an upwardly directed outer wall and a generally flat bottom,

an inlet pipe extending vertically through the center portion of said tank,

a cylindrically shaped compartment positioned about said inlet pipe in the center portion of said tank and having an upwardly directed outer wall,

a carriage supported between the upper portion of said tank wall and the upper portion of said compartment wall,

means for circular movement of said carriage around the vertical axis of the tank supported by said carriage, and means on said carriage supporting a fluid distributor in fluid communication with said inlet pipe to discharge inlet water into said tank, and a spiral scoop sludge collector,

the improvement comprising means defining a flocculation chamber having a closed front end, an open back end, and a closed bottom carried by said carriage,

said fluid distributor positioned ahead of the closed end of said flocculation chamber,

an upwardly directed circular wall defining a sludge storage space within said compartment around said inlet pipe to receive sludge collected by said scoop,

sludge discharge means for said sludge storage space,

said upwardly directed circular wall defining with the wall of said compartment a clarified water storage space positioned outwardly of said sludge storage space,

clarified water discharge means for said clarified water storage space,

filter means extending substantially over the bottom of said tank outwardly of said cylindrically shaped compartment,

means radially dividing said filter means into horizontally positioned sections,

horizontally extending filter partitions extending across said horizontally positioned sections defining filter receiving space on the top thereof,

said horizontally extending filter partitions defining clarified water receiving spaces positioned thereunder,

clarified water inlet means leading from said clarified water receiving space to said clarified water storage space,

filter back washing means for at least one of said filter sections carried by the carriage at the leading end thereof and operable while the remainder of said filter sections are filtering water into said clarified water storage space,

dissolved air in water injection means carried by the carriage at the lower back end of the flocculation chamber above the floor thereof and providing air bubble action engaging flocs in the water and producing a generally upward current flow of water and flocs in said tank in the vicinity of said bubble action,

said filter means permitting the outward flow of clarified water from the lower portion of said tank thereby producing a downward current flow of water and flocs in said tank at a lesser rate than the rate of upward current flow produced by said air bubble and said water in which said air was dissolved in the vicinity thereof so that the majority of flocs in the water are floated to be removed by said spiral scoop and the remainder of the flocs are deposited on said filter means to be subsequently removed by the action of said backwashing means.

8. The method of clarifying water having suspended particles therein comprising

providing a body of said water in a circular tank having a filter chamber extending over substantially its entire lower surface so that the flow of water through the filter provides an even downward current in the body of water,

mixing additional water to be clarified with flocculating material,

providing a distribution and open ended flocculation chamber immersed in said tank of water, said flocculation chamber being of a size relative to the quantity of inlet water introduced therein so that the majority of flocculation action is achieved within said chamber,

introducing said water with flocculating material into said distribution and flocculation chamber at the same rate as water is passed through said filter while moving said distribution and flocculation chamber circularly within said tank,

providing a dissolved air in water source with a discharge therefor positioned at the lower portion of said open ended flocculation chamber,

and discharging the dissolved air in water at a predetermined rate thereby providing an even upward current moving flocs upwardly in the body of water in the vicinity of said open-ended flocculation chamber at a flow rate greater than the rate of the rate of the downward current caused by water passing through the filter so that the majority of the particles in the water are carried upwardly with flocs and the remainder of the particles are blocked by the filter whereby water discharged from the filter is clarified.

4,377,486

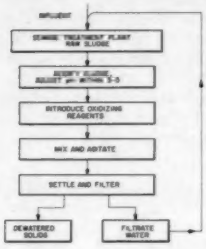
ORGANIC SLUDGE DEWATERING PROCESS

Paul E. Barrick, and George L. Zarur, both of Springfield, Va., assignors to WRC Processing Company, McLean, Va.

Filed Dec. 24, 1980, Ser. No. 220,216

Int. Cl.³ C02F *1/52, 1/76*

U.S. Cl. 210—712 **19 Claims**



1. A process for dewatering an activated-bacteria organic sludge initially containing in its organic cellular structure 70 to 90% water by weight and containing metal values and calcium, by rupturing the cellular structure to release water therefrom with minimal degradation of the organic structure and minimal loss of fuel value while retaining most of the metal values entrained in the dewatered sludge, the process consisting of:

(a) isolating the sludge into a batch whose volume is known;

(b) adding acidifying and oxidizing reagents to the batch so that they are simultaneously present therein, and mixing the reagents with the batch;

(c) the acidifying reagent comprising mineral acids added in such quantity as would in the absence of the oxidizing reagent adjust the pH of the batch into a range between 3 and 5;

(d) the oxidizing reagent being added to the batch in such quantity as would in the presence of the acidifying reagent within half an hour result in sufficient release of water from the cellular structure to increase by at least one the adjusted pH; and

(e) separating the supernatant water released out of the cellular structure from the remaining organic matter and solid matter including most of said metal values.

3. The dewatering process as claimed in claim **1**, wherein the batch of sludge is taken from a sewage treatment plant, and wherein the separated supernatant water is returned to the sewage treatment plant as influent.

4,377,487

METAL COATING PROCESS AND COMPOSITIONS

Dennis B. Freeman, North Harrow, Great Britain, assignor to Occidental Chemical Corporation, Warren, Mich.

Filed Oct. 19, 1979, Ser. No. 86,509

Claims priority, application United Kingdom, Oct. 31, 1978, 42675/78

Int. Cl.³ C10M *1/40*

U.S. Cl. 252—33.4 **16 Claims**

1. In an aqueous acidic lubricant coating composition useful

as is or when diluted with water for treating metal surfaces prior to metal forming operations, which composition is an aqueous emulsion which contains:

(a) at least about 0.2 wt. % phosphate ions;
(b) from about 0.3 to about 16 wt. % of an emulsified organic lubricant selected from the group consisting of C_8 to C_{40} carboxylic acids and alcohols including esters, mono and polyamine salts, mono and polyalkyl (C_1–C_{18}) amine salts thereof as well as mixtures thereof;
(c) from about 0.1 to about 10 wt. % of a cationic emulsifying agent;
(d) at least about 0.1 wt. % of metal other than alkali metal ions; and
(e) water,

and is characterized by the formation therein, during use, of an adherent wax scale which builds up on the apparatus in which the composition is used, the improvement which comprises incorporating in said composition from about 0.05 to 5.0 weight % of at least one scale prevention additive selected from the group consisting of naphthalene sulfonic acid/formaldehyde condensation products and the alkali metal or ammonium salts thereof, which agent is effective in preventing the formation of said wax scale.

10. A method of treating a clean metal surface to form a lubricant coating thereon prior to metal forming operations which comprises the steps of contacting said surface with a composition as defined in claim 1 for a period of time sufficient to form a coating and thereafter drying said surface.

4,377,488
PROCESS OF MAKING CALCIUM ACETATE DEICING AGENTS

Alan B. Gancy, 265 Robineau Rd., Syracuse, N.Y. 13207

Filed Dec. 21, 1981, Ser. No. 333,037
Int. Cl.³ C09K *3/18*; C07C *51/41*; C01F *11/00*
U.S. Cl. 252—70 **5 Claims**

2. In a process of making a calcium acetate-containing solution having a pH value at room temperature in the range from about 7 to about 8, the steps comprising:

a. completely reacting a carbonate with acetic acid, wherein the amount of said carbonate comprises from about 50% to about 70% of the total stoichiometric complement of said acid;
b. adding calcined limestone in an amount comprising from about 25% to about 50% of said total stoichiometric complement; and
c. adding an alkali metal hydroxide in an amount comprising from about 2% to about 5% of said total stoichiometric complement.

4,377,489
INORGANIC PERSULFATE CLEANING SOLUTION FOR ACOUSTIC MATERIALS

Jeffrey J. King, Orange, Calif., assignor to Ceil Clean Corporation, Inc., Riverside, Calif.

Filed Mar. 16, 1981, Ser. No. 243,868
Int. Cl.³ C11D *3/08, 7/56*
U.S. Cl. 252—99 **14 Claims**

9. A cleaning solution for acoustic material containing (i) a solution of an oxidizing material selected from the class consisting of: ammonium persulfate, sodium persulfate and potassium persulfate and, (ii) a stable, aqueous solution containing the following components: a cleaning detergent consisting of a surfactant or emulsifier, a soil suspender comprising tetrapotassium pyrophosphate, sodium tripolyphosphate, Na or K hexametaphosphate, or Na or K silicates, a water miscible solvent, a chelating agent comprising a salt of ethylene diamine tetraacetic acid or hydroxyethyl ethylene diamine triacetic acid, a pH adjusting agent, and a hydrotrope selected from the class consisting of Na or K xylene sulfonate, phosphate ester surfactants and mixtures thereof to maintain the aqueous solution in a single phase and to stabilize a solution of the oxidizing agent and the solution of the said components, the cleaning solution having a stability period of about 5 to 10 days, the cleaning detergent being nonreactive with the oxidizer.

4,377,490
ADHESIVE COMPOSITION

Yoshihisa Shiraishi; Kazuhiro Nakagawa; Chiaki Nakata, and Koiti Ohasi, all of Osaka, Japan, assignors to Sumitomo Chemical Company, Limited and Taoka Chemical Co., Ltd., both of Osaka, Japan

Continuation-in-part of Ser. No. 111,820, Jan. 14, 1980, Pat. No. 4,307,216. This application Sep. 9, 1981, Ser. No. 300,639
Claims priority, application Japan, Jun. 29, 1979, 54-83026; Apr. 10, 1981, 56-54631
Int. Cl.³ C08F *220/36*; C09J *3/14, 3/00*
U.S. Cl. 252—188.3 R **14 Claims**

1. An adhesive composition which comprises (A) an α-cyanoacrylate ester, (B) at least one chosen from aliphatic polyols and their derivatives and polyethers and their derivatives and (C) at least one chosen from aromatic polyols and their derivatives and carboxylic acids and their derivatives.

4,377,491
OXYCHLORINATION CATALYST PRECURSOR AND PROCESS FOR ITS PREPARATION

Roberto Canavesi, Arese; Roberto Ghezzi, Cusano Milanino, and Vittorio Tagliabue, Limbiate, all of Italy, assignors to Enteco Impianti S.p.A., Milan, Italy

Filed Jan. 3, 1982, Ser. No. 345,465
Claims priority, application Italy, Feb. 12, 1981, 19689 A/81; Aug. 17, 1981, 68126 A/81
Int. Cl.³ B01J *27/10*
U.S. Cl. 252—441 **5 Claims**

1. Oxychlorination catalyst precursor constituted by porous microspheroidal alumina particles impregnated with cupric chloride, characterized in that: the cupric chloride content is from 3 to 7% by weight (expressed in terms of copper metal); the particles have a water content of from 0.5 to 2% by weight; and the copper is uniformly distributed over the entire surface area of each particle, with a degree of non-uniformity of not more than ±7%.

4,377,492
POST EMULSIFIABLE FLUORESCENT PENETRANT

John P. Jones, Long Beach, Calif., assignor to Purex Corporation, Lakewood, Calif.

Filed Sep. 8, 1980, Ser. No. 184,945
Int. Cl.³ C09K *11/00*; G01N *21/00*
U.S. Cl. 252—301.19 **11 Claims**

1. A post emulsifiable penetrant composition for application and entry into flaws in solid surfaces, consisting essentially of

(a) 1–40 percent, by weight, of a first solvent ingredient comprising an aromatic hydrocarbon having a boiling point within the range of from about 350° F. to about 600° F.,
(b) 20–80 percent, by weight, of a second solvent ingredient selected from the group that consists of phthalates,
(c) 10–25 percent, by weight, of epoxidized material selected from the group that consists of epoxidized soybean oils,
(d) 0.1–3.0 percent, by weight, or fluorescent dye, and
(e) 0.1–4.5 percent, by weight, of fluorescent brightener,
(f) said weight percentages adjusted to produce visible fluorescence under blacklight in a groove of the following dimensions,
(i) width about 0.1–2 microns
(ii) depth about 10–50 microns.

4,377,493

DEFOAMER COMPOSITION AND USE THEREOF

Francis J. Boylan, Newton; Clemmon Porter, Boonton, and Olga D. Bruno, Randolph, all of N.J., assignors to Drew Chemical Corporation, Boonton, N.J.

Filed Jun. 26, 1981, Ser. No. 277,630
Int. Cl.³ B01D 19/02, 19/04
U.S. Cl. 252—321 13 Claims

1. In a defoamer composition wherein hydrophobic silica is dispersed in a water insoluble hydrophobic organic liquid, the improvement comprising:

said hydrophobic silica being present in an amount in excess of 25% and no greater than 65%, by weight, of the composition, and said hydrophobic silica having been prepared from a silica having a surface area of no greater than 0.2 m^2/g.

4,377,494

CRACKING CATALYSTS PASSIVATED BY BARIUM

Brent J. Bertus, and Dwight L. McKay, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 15, 1980, Ser. No. 112,265
Int. Cl.³ C10G 11/02, 11/05
U.S. Cl. 252—411 R 16 Claims

1. A process to passivate the metals on a cracking catalyst comprising contacting a zeolite-modified silica-alumina fluid catalytic cracking catalyst having deposited thereon a detrimental amount of at least one detrimental metal selected from the group consisting of nickel, vanadium and iron with a treating agent selected from barium and barium compounds so as to impart to said cracking catalyst a barium concentration of from about 0.01 to about 8 weight percent and mitigate the worsened cracking characteristics of the catalyst caused by the at least one detrimental metal.

4,377,495

REGENERATION OF SULFUR-CONTAMINATED PLATINUM-ALUMINA CATALYST

Harold F. Tse, Kearny, N.J., assignor to Engelhard Corporation, Iselin, N.J.

Filed Mar. 11, 1982, Ser. No. 357,030
Int. Cl.³ B01J 23/96, 21/20; C10G 35/08
U.S. Cl. 252—415 10 Claims

1. In a method of regenerating a deactivated sulfur-containing hydrocarbon conversion catalyst comprising platinum on an alumina support by burning coke from said catalyst with an oxygen-containing gas wherein sulfur is removed from said catalyst prior to burning coke therefrom by contacting said deactivated catalyst at an elevated temperature in the range of 350° to 600° C. with a hydrogen-rich gas comprising liquid or gaseous water and a chlorine compound, the improvement which comprises removing sulfur from said catalyst by contacting said deactivated catalyst at said elevated temperature with a hydrogen-rich gas containing liquid or gaseous water and an oxygen-containing organic compound containing one to eight carbon atoms per molecule and selected from the class consisting of hydroxylated compounds, ketones and ethers and having dissolved therein a chlorinated hydrocarbon containing one to eight carbon atoms per molecule in relative proportions in the range of 5 to 100 volumes of said oxygen-containing organic compound for each volume of said chlorinated hydrocarbon, and maintaining the rate of addition of said oxygen-containing organic compound and said chlorinated hydrocarbon dissolved therein such that the relative proportions of water and said chlorinated hydrocarbon are in the range of about 20 to about 80 mols of water per atomic equivalent of chlorine, withdrawing from said zone an effluent gas stream containing hydrogen sulfide, and continuing said process until the hydrogen sulfide content of said effluent gas stream is reduced to a desired concentration.

2. The method according to claim 1 wherein said oxygen-containing compound is an alkanol.

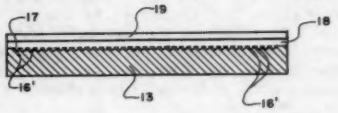
5. The process of claim 1 wherein said oxygen-containing compound is methyl ethyl ketone.

4,377,496

GAS DIFFUSION ELECTRODE AND PROCESS

Frank Solomon, Great Neck, N.Y., assignor to Diamond Shamrock Corporation, Dallas, Tex.

Filed May 4, 1981, Ser. No. 260,408
Int. Cl.³ C25B 11/02; C25S 11/06
U.S. Cl. 252—425.3 6 Claims



1. A method for preparing an oxygen cathode comprising rolling or pressing silver powder into a plaque substrate and including an extractable particulate material on one surface thereof; sintering the plaque containing said extractable material; removing said extractable material to produce a plaque electrode substrate having anchor site depressions in one surface; depositing an active layer material containing catalyzed or uncatalyzed carbon on said one surface and then depositing a layer of hydrophobic backing material on said active layer.

4,377,497

CATALYST FOR OLEFIN POLYMERIZATION

Arthur W. Chester, Cherry Hill, and James G. Murray, East Brunswick, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 24, 1981, Ser. No. 305,233
Int. Cl.³ C08F 4/02, 4/58, 4/78
U.S. Cl. 252—430 9 Claims

1. A catalyst composition especially suitable for promoting polymerization of 1-olefins, said composition comprising the reaction product of

(A) a pi-bonded organochromium [II] compound; and

(B) a crystalline aluminosilicate zeolite having a silica to alumina molar ratio of at least about 12 and a Constraint Index within the approximate range of about 1 to 12.

4,377,498

AQUEOUS PEROXIDE EMULSION FOR USE WITH GLASS FIBERS

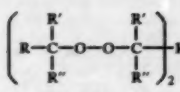
Chester S. Temple, McKees Rocks, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 2, 1980, Ser. No. 136,630
Int. Cl.³ C08F 4/34
U.S. Cl. 252—431 C 24 Claims

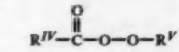
1. An aqueous emulsion of an organic peroxide solid at 20° C. and having a half-life exceeding 60 hours at 212° F. (100° C.) and 20 minutes at 300° F. (149° C.), wherein the emulsion has an average particle size of around 1.5 microns or less and is dilutable to a water-thin liquid, comprising:

(a) about 1 to about 70 percent by weight of the emulsion of a mixture of:

(1) said solid organic peroxide selected from bis-peroxides having the formula:

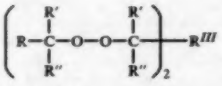


wherein R is hydrogen, alkyl hydrocarbon radical or phenyl and R′ and R″ are hydrogen or alkyl hydrocarbon radicals and R‴ is a phenyl, alkyl phenyl or $(CH_2—CH_2)_n$ moiety, where n is 1, 2 or 3 or C=C containing moiety and peroxyesters having the formula:

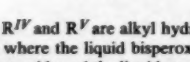


wherein R^{IV} and R^{V} are alkyl hydrocarbon radicals or phenyls and

(2) organic peroxide liquid at 20° C. in an amount to solubilize, at least a major amount of said solid organic peroxide, where the liquid organic peroxides have a half-life exceeding 60 hours at 212° F. (100° C.) and 20 minutes at 300° F. (149° C.) and have the following bis-peroxide formula:



wherein R is hydrogen, alkyl hydrocarbon radical or phenyl and R′ and R″ are hydrogen or alkyl hydrocarbon radicals and R‴ is a phenyl, alkyl phenyl or (C=C) or $(CH_2—CH_2)_n$ moiety, where n is 1, 2 or 3 or the following peroxyester formula:



wherein R^{IV} and R^{V} are alkyl hydrocarbon radicals or phenyls, where the liquid bisperoxide is used with the solid bisperoxide and the liquid peroxyester is used with the solid peroxyester, and

(b) about 0.005 to about 15 weight percent of the emulsion of one or more emulsifiers selected from cationic, anionic and nonionic emulsifiers, and

(c) the remaining weight percent of the emulsion in water.

4,377,499

NICKEL COMPLEXES IN DIOL SOLVENTS AND THEIR USE AS OLIGOMERIZATION CATALYST PRECURSORS

Albert E. O'Donnell, and Clarence R. Gum, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 116,687, Jan. 30, 1980, Pat. No. 4,260,844. This application Nov. 17, 1980, Ser. No. 207,177

Int. Cl.³ B01J *31/12*

U.S. Cl. 252—431 R **10 Claims**

1. A stable complex solution of nickel, ethylene and hydride in an aliphatic diol solvent formed by contacting in the presence of ethylene and in the aliphatic diol solvent (1) a simple divalent nickel salt, (2) a base and (3) a boron hydride transfer agent.

4,377,500

CATALYSTS

R. K. Grasselli, Chagrin Falls; D. D. Suresh, Macedonia; R. J. Zagata, Seven Hills, and G. E. Force, Richmond Heights, all of Ohio, assignors to The Standard Oil Co., Cleveland, Ohio

Filed Jul. 8, 1981, Ser. No. 281,160

Int. Cl.³ B01J *21/08, 21/16, 27/02*

U.S. Cl. 252—432 **12 Claims**

1. In a single slurry process for producing a fluid-bed catalyst comprising an antimonate-based oxide complex supported on a catalyst support in which (1) source compounds containing all of the elements of said oxide complex and said support material are combined to form a pre-catalyst slurry, (2) liquid is removed from said pre-catalyst slurry to form a pre-catalyst, and (3) said pre-catalyst is heated at elevated temperature to form said catalyst, the improvement wherein the support material combined with said source compounds in step (1) is composed of (a) a fumed catalyst support material and (b) a catalyst support material sol.

4. The process of claim 1 wherein said antimonate-based catalyst has the formula

$$A_aB_bSb_2O_x$$

wherein

A is Fe, U, Sn, Th, Cr, Ti, Ce, Mg and/or Mn; and

B is Zr, V, W, Mo, As, B, Cu, Pr, Al, Te, rare earth metals, alkali metals, alkaline earth metals other than Mg and/or Bi., and further;

wherein

a is greater than 0 to 10;

b is 0 to 10;

c is 0.1 to 40; and

when A is other than Sn and/or Ti, a+b<c

x is a number determined by the valence requirements of the other elements present.

11. The catalyst produced by the process of claim 4.

4,377,501

CATALYST AND PROCESS FOR PRODUCING METHACRYLIC ACID

Sargis Khoobiar, Kinnelon, N.J., assignor to The Halcon SD Group, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 973,354, Dec. 26, 1978, Ser. No. 972,745, Dec. 26, 1978, Pat. No. 4,252,682, and Ser. No. 973,495, Dec. 26, 1978, Pat. No. 4,252,683. This application Jun. 12, 1979, Ser. No. 47,860

Int. Cl.³ B01J *27/14*

U.S. Cl. 252—437 **2 Claims**

1. A catalyst composition suitable for the vapor-phase oxidation of methacrolein to produce methacrylic acid having the formula $Mo_aCU_bP_cSb_dCs_eRe_fO_g$, where a=12; b=0.05–3; c=0.1–5; d=0.01–1; e=0.1–3; f=0.005–0.5; and g=value determined by the valence and proportions of the other elements of the formula.

4,377,502

SYNTHESIS OF CRYSTALLINE ALUMINOSILICATE MOLECULAR SIEVES

Marvin R. Klotz, Batavia, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 107,145, Dec. 26, 1979, abandoned, and a continuation-in-part of Ser. No. 107,147, Dec. 26, 1979, abandoned. This application Dec. 19, 1980, Ser. No. 218,276

Int. Cl.³ C01B *33/28;* **B01J** *29/06*

U.S. Cl. 252—455 Z **28 Claims**

1. A method to prepare a mordenite, ferrierite, ZSM-4 or ZSM-5 crystalline aluminosilicate molecular sieve comprising (1) forming an aqueous mixture of sources for an oxide of aluminum and an oxide of silicon, a cation and an alkali metal

cation-complexed ether wherein the composition of the mixture of initial reactants in terms of mole ratios of oxides is:

SiO_2/Al_2O_3	8–80
$R_2O^+(R_2O^+ + M_{2/n}O)$	0.2–0.95
OH^-/SiO_2	0.01–3
H_2O/OH^-	10–500

where R is an alkali metal cation-complexed ether and M is at least one cation having a valence n, (2) maintaining the pH of such mixture between about 9 and about 14 and (3) crystallizing such mixture at a pressure at least the vapor pressure of water for about 0.25 to about 20 days at about 125° to about 200° C.

4,377,503

SHAPE SELECTIVE METALLIC CATALYSIS

Ralph M. Dessau, Edison, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,677
Int. Cl.³ B01J 29/28
U.S. Cl. 252—455 Z 21 Claims

1. A method for preparing a shape selective metallic catalyst which comprises incorporating a metallic catalyst component into a zeolite, said zeolite having a silica to alumina mole ratio of at least 12 and a constraint index of 1 to 12, followed by reduction in the presence of one or more unsaturated hydrocarbon compounds at a temperature in the range of from about 100° C. to about 500° C.

2. The method of claim 1 wherein said reduction further comprises the presence of hydrogen.

3. The method of claim 1 wherein said reduction further comprises the presence of nitrogen.

9. The method of claim 1 wherein said unsaturated hydrocarbon compound is an olefin.

4,377,504

CRACKING CATALYST IMPROVEMENT WITH GALLIUM COMPOUNDS

John S. Roberts; Dwight L. McKay, and Brent J. Bertus, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 1, 1981, Ser. No. 259,390
Int. Cl.³ B01J 29/06, 21/12, 23/08
U.S. Cl. 252—455 Z 9 Claims

1. A composition comprising a zeolite modified hydrocarbon cracking catalyst containing from about 60 to about 99 percent by weight of amorphous silica alumina matrix and from about 1 to about 40 percent by weight of crystalline zeolitic material dispersed within the matrix and having deposited thereon a treating agent selected from the group consisting of gallium and a compound of gallium in an amount sufficient enough to impart to the composition a concentration of gallium of about 0.001 to about 1 percent by weight.

4,377,505

ELECTRICAL RESISTOR AND FABRICATION THEREOF

Charles W. Eichelberger, Schenectady, and Robert J. Wojnarowski, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,937
Int. Cl.³ H01B 1/02
U.S. Cl. 252—512 9 Claims

1. An electrical resistor, comprising: a polymeric binder; and finely-divided particles, having a particle size of less than 50 microns, of at least one member of the group consisting of the brown oxide of molybdenum and brown, purple, blue and yellow oxides of tungsten in said binder in an amount wherein said oxides are about 60–80 volume percent of the mixture of said oxides and said binder and sufficient to provide a desired bulk resistivity.

4,377,506

FIRE RETARDANT POLYMER COMPOSITIONS CONTAINING A BORATE-SULFATE MIXTURE

Robert W. Sprague, Rancho Palos Verdes, Calif., assignor to United States Borax & Chemical Corporation, Los Angeles, Calif.

Filed Dec. 8, 1980, Ser. No. 213,979
Int. Cl.³ C08K 3/28
U.S. Cl. 252—609 16 Claims

1. A fire-retardant additive comprising antimony oxide and a borate-sulfate mixture formed by reaction of sulfuric acid with a borate selected from alkali metal borates, alkaline earth metal borates, and mixtures thereof.

4,377,507

CONTAINING NUCLEAR WASTE VIA CHEMICAL POLYMERIZATION

James M. Pope, Monroeville; Susan Wood, Pittsburgh, and Don E. Harrison, Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 25, 1980, Ser. No. 162,967
Int. Cl.³ G21F 9/16
U.S. Cl. 252—629 9 Claims

1. A method of immobilizing nuclear waste comprising:

(A) preparing a composition which comprises:

(1) about 60% to about 100% by weight, calculated as SiO_2, of a hydrolyzed silicon compound having the general formula $SiR_m(OR')_nX_p$ or $Si(OSiR)_4$ where each R is independently selected from alkyl to C_{10} and alkenyl to C_{10}, each R′ is independently selected from R and aryl, each X is independently selected from chlorine and bromine, m is 0 to 3, n is 0 to 4, p is 0 to 1, and m+n+p equals 4;

(2) up to about 40% by weight, calculated as Al_2O_3, of an aluminum compound having the general formula $AlR_q'(OR)_rX_s$ or $Mg(Al(OR)_4)_2$, where each R is independently selected from alkyl to C_{10} and alkenyl to C_{10}, each R′ is independently selected from R or aryl, q is 0 to 3, r is 0 to 3, s is 0 to 1, and q+r+s equals 3;

(B) mixing 1 to about 50%, based on total weight, of said nuclear waste in liquid form into said composition;

(C) mixing up to about 10%, based on total weight, of said nuclear waste in solid form into said composition; and

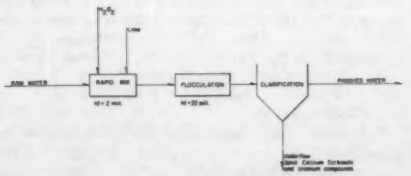
(D) heating said composition containing said nuclear waste at about 200° to about 500° C. to drive off water and organics.

4,377,508

PROCESS FOR REMOVAL OF RADIOACTIVE MATERIALS FROM AQUEOUS SOLUTIONS

Michael R. Rothberg, 8268 S. Locust St., Englewood, Colo. 80112

Filed Jul. 14, 1980, Ser. No. 205,051
Int. Cl.³ G21F 9/10
U.S. Cl. 252—631 6 Claims



1. A process for decontaminating a water solution having

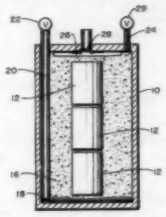
contained therein naturally occurring radioactive materials having both alpha and beta activity, said solution having a pH of less than 11.0, comprising the following steps: adjusting the pH of the solution to at least 8.0; incorporating lime into the solution to obtain a pH of greater than 11.0, the dosage of lime being on the order of 110 mg/l; simultaneously incorporating with the lime approximately 6.0 mg/l of hydrogen peroxide and rapidly mixing said solution; slowly mixing said solution for a period of about twenty minutes to thereby form colloidal particles in said solution; and separating the colloidal particles from the solution.

4,377,509

PACKAGING FOR OCEAN DISPOSAL OF LOW-LEVEL RADIOACTIVE WASTE MATERIAL

Harvey H. Haynes, Camarillo, and Robert D. Rail, Ojai, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 14, 1980, Ser. No. 167,851
Int. Cl.³ G21F 9/24
U.S. Cl. 252—633 23 Claims



1. A packaging system for ocean disposal of low-level radioactive waste material, comprising:

a. a non-degradable exterior shell structure having a top and a bottom and side walls which provides a good barrier to contain radionuclides and being operable to house a plurality of containers of low-level radioactive waste material;

b. a plurality of said containers of radioactive waste material being housed within said shell structure and spaced apart from the interior walls of said exterior shell structure;

c. space between said containers of radioactive waste and between said containers and the interior walls of said exterior shell structure being filled with a hardenable filler material in a plastic state that is operable to be molded about said containers of radioactive waste and hardened, said hardened filler material being suitable to contain any leakage from said containers;

d. a space being provided between the top wall of said exterior shell structure and said hardenable filler material;

e. a pressure-compensation means located inside said exterior shell structure in said space between the top wall thereof and said filler material to provide for pressure-compensation under hydrostatic loading to compress said filler material while in its plastic state during free-fall to the ocean floor while simultaneously isolating seawater from said filler material; whereby as said containers of radioactive waste (which are normally not pressure-compensated) are compressed in volume due to pressure loading, said plastic state filler material will be forced to follow any deflection thereof and stay in intimate contact therewith as the entire assembly comprising the exterior shell structure, containers of radioactive waste and filler material sink to the ocean floor where the filler material hardens to form an intimate barrier against leakage and which also operates to prevent corrosion of the exterior surfaces of said containers;

f. said filler material forming a first barrier against leakage should a radioactive waste container fail, and said exterior shell structure forming a second barrier against leakage of said radioactive waste;

g. said pressure-compensation means assuring integrity of said exterior shell structure at any ocean depth, and also providing the driving force to assure that said filler material is forced into and remains in intimate contact with said radioactive waste containers as it hardens.

14. A packaging system for ocean disposal of low-level radioactive waste material, comprising:

a. a non-degradable exterior shell structure having a top and a bottom and side walls which provides a good barrier to contain radionuclides, and being operable to house a plurality of containers of low-level radioactive waste material;

b. a plurality of said containers of low-level radioactive waste material being stacked within said exterior shell structure and spaced apart from the interior walls of said exterior shell structure;

c. a plurality of tubular passageways positioned adjacent to said radioactive waste containers and extending to a point above said containers and below the top of said exterior shell structure;

d. said tubular passageways being perforated near the mid-length of each said container of radioactive waste; said perforations being covered with a closure rupturable at a given hydrostatic pressure;

e. the spaces between said containers of radioactive waste and the bottom and sidewalls of said exterior shell structure being filled substantially to the top of said tubular passageways, but not within said tubular passageway, with a solidifiable filler material introduced in a moldable plastic state and hardened therein;

f. a space being provided between the top wall of said exterior shell structure and the tops of said tubular passageways and said sdolidifiable filler material;

g. a first valve means allowing access from outside said exterior shell structure to the space between the top thereof and the top of said solidifiable filler material;

h. a pressure-compensation means located within said space between the top of said exterior shell structure and the top of said solidifiable filler material to provide for pressure compensation under hydrostatic loading to compress any plastic state material within said space during free-fall to the ocean floor of the assembly (comprising said exterior shell structure, radioactive waste containers and filler material) while simultaneously isolating seawater from said filler material;

i. a cement slurry mixture, which is introduced into said space and said tubular passageways via said first valve means prior to ocean dumping and free-fall to the ocean floor of said assembly, being operable to be compressed by said pressure compensation means and forced through said tubular passageways and through said perforations rupturing said closures to follow any deflection of said radioactive waste containers (which are normally not pressure-compensated) as they are compressed in volume and tend to separate from said solidifiable filler material due to pressure loading; said cement slurry being forced around the compressed radioactive waste containers under pressure, and hardened in place as the assembly rests on the ocean floor to form an intimate barrier against leakage and which also operates to prevent corrosion of the exterior surfaces of said containers.

4,377,510

URETHANE-MODIFIED ROSIN ESTER AND PROCESS FOR PREPARING THE SAME

Erwin R. Ruckel, Wilton, and Martin Epstein, Norwalk, both of Conn., assignors to Arizona Chemical Company, Fairlawn, N.J.

Filed Nov. 30, 1981, Ser. No. 325,701
Int. Cl.³ C08L 93/00
U.S. Cl. 260—97 9 Claims

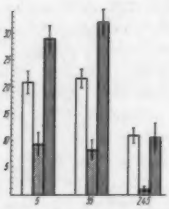
1. A urethane-modified rosin ester of a primary polyhydric alcohol having from about 50% to about 95% of the hydroxyl groups of the alcohol esterified with rosin and the remaining hydroxyl groups of the alcohol modified by reaction with an aromatic or aliphatic isocyanate, with no more than negligible unreacted hydroxyl content.

4,377,511

PREPARATION FOR CONTROL OF T-SYSTEM OF IMMUNITY AND METHOD FOR PRODUCING SAME

Jury M. Lopukhin, Kutuzovsky prospekt, 45, kv. 31; Rem V. Petrov, Zhivopisnaya ulitsa, 50, kv. 43; Vitaly Y. Arion, Teply stan, 9 mikroraion, korpus 4, kv. 120; Jury N. Breusov, Belovezhskaya ulitsa, 49, kv. 30; Tatyana V. Gladysheva, ulitsa Volgina, 39, kv. 25; Irina V. Sanina, ulitsa Koptevskaya, 18v, kv. 126; Vasily V. Lebedev, Teply stan, 9 mikroraion, korpus 4, kv. 118, all of Moscos; Serafima S. Kirzon, Moskovskaya oblast, ulitsa Pobedy, 18, kv. 55, Balashikha, and Evgeny F. Ivanushkin, ulitsa Godovikova, 16, kv. 18, Moscow, all of U.S.S.R.

Filed Nov. 3, 1980, Ser. No. 203,347
Int. Cl.³ C07G 7/00; A61K 37/00
U.S. Cl. 260—112 R 9 Claims



1. An active principle effective for control of the T-system of immunity, said active principle being obtained by removing thermolabile proteins from a solution of homogenized thymus gland tissue in a sodium chloride solution, precipitating proteins and peptides from the solution, dissolving the same in a solvent therefor, salting out the peptides from the solution, dissolving the peptides, subjecting the resulting solution to ultrafiltration, and subjecting the resulting ultrafiltrate to gel chromatography, and said active principle consisting of polypeptides with a molecular mass of from 1,500 to 6,000 Dalton, having the maximum of absorption in UV-light as 208 and 275 nm and the electrophoretic mobility in a polyacrylamide gel relative to bromophenol blue of: 0.062–0.102; 0.156–0.236; 0.354–0.374; 0.382–0.422; 0.432–0.472; 0.485–0.545; 0.850–0.930.

4,377,512

OXYGEN CARRIER FOR BLOOD SUBSTITUTE

Katsumi Ajisaka, Yokohama, and Yuji Iwashita, Kawasaki, both of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Jun. 26, 1981, Ser. No. 277,950
Claims priority, application Japan, Jul. 2, 1980, 55-90316
Int. Cl.³ C07G 7/00
U.S. Cl. 260—112 B 9 Claims

1. A hemoglobin modified by covalently bound inulin.

4,377,513

PROCESS FOR THE PRODUCTION OF HUMAN ERYTHROPOIETIN

Kaname Sugimoto, and Yasushi Hayashibara, both of Okayama, Japan, assignors to Ken Hayashibara, Okayama and Shin Ashida, Hyogo, both of, Japan

Filed Aug. 10, 1981, Ser. No. 291,848
Claims priority, application Japan, Aug. 25, 1980, 55-115950
Int. Cl.³ A61K 37/24; C07G 7/00
U.S. Cl. 26—112 R 11 Claims

1. A process for the production of human erythropoietin, comprising

(1) multiplying human lymphoblastoid cells capable of producing human erythropoietin by transplanting said cells to a non-human warm-blooded animal body, and allowing the multiplied human lymphoblastoid cells to release human erythropoietin, or

(2) multiplying human lymphoblastoid cells capable of producing human erythropoietin by allowing said cells to multiply with a device by which the nutrient body fluid of a non-human warm-blooded animal is supplied to said cells, and allowing the multiplied human lymphoblastoid cells to release human erythropoietin.

4,377,514

METHOD FOR PRODUCING FACTOR FOR THE STIMULATION OF THE LIVER CELL PROLIFERATION RATE

Gerhard Ruhenstroth-Bauer, Gräfelfing; Michel Goldberg, and Hubertus Schneider, both of Munich, all of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften E.V., Fed. Rep. of Germany

Filed Oct. 5, 1981, Ser. No. 308,355
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1980, 3037600
Int. Cl.³ A61K 35/55, 37/02; C07G 7/00
U.S. Cl. 260—112 R 5 Claims

1. A process for producing a factor for stimulating the rate of proliferation of liver cells which comprises homogenizing the Peyer's glands of animals, adjusting the pH of the homogenized product to approximately 5.5, thermally denaturing the pH adjusted product, and centrifuging the denatured product to provide a supernatant containing said factor.

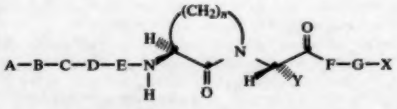
4,377,515

LONG LASTING AGONISTS AND ANTAGONISTS OF LH-RH

Daniel F. Veber, Ambler, and Roger M. Freidinger, Hatfield, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 1, 1979, Ser. No. 80,844
Int. Cl.³ C07C 103/52; A61K 37/00
U.S. Cl. 260—112.5 LH 6 Claims

1. A novel peptide of the formula:



(I)

wherein for A the L- or D- N-acetyl or N-pyroGlu imino acid is a member selected from the group consisting of N-acetyl-Pro, N-acetyl-Hyp, N-pyroGlu-Pro, and N-pyroGlu-Hyp; for B the L- or D-aromatic amino acid is a member selected from the group consisting of Phe, Trp, Tyr, and His, and the L- or D- aliphatic amino acid is a member selected from the group consisting of Ala, Leu, Ile, and Val; for C the L- or D- aromatic amino acid is a member selected from the group consisting of Phe, Trp, Tyr, and His, and the L- or D- aliphatic amino acid is a member selected from the group consisting of Ala, Leu, Ile, and Val; for E the aromatic amino acid is a member

selected from the group consisting of Phe, Trp, Tyr, and His; for F the amino acid with a basic side chain is a member selected from the group consisting of Lys, Arg, and Orn; and for G the imino acid is a member selected from the group consisting of Pro and Hyp, and the aliphatic amino acid is a member selected from the group consisting of Ala, Leu, Ile, and Val.

4,377,516

ANTIGENIC LINEAR PEPTIDE COMPOUNDS

Erwin Goldberg, Evanston, Ill., assignor to Northwestern University, Evanston, Ill.

Filed Dec. 10, 1981, Ser. No. 329,242
Int. Cl.³ C07C *103/52*
U.S. Cl. 260—112.5 R **6 Claims**

1. The antigenic peptide compounds having chain lengths of from 10 to 14 amino acids arranged in a sequence from N-terminal to C-terminal amino acids which include the antigenic sequence Arg-Met-Val-Ser-Gly-Gln-Thr-Arg-Leu-Asp, said compounds being selected from the class of compounds consisting of:

(a) Arg-Met-Val-Ser-Gly-Gln-Thr-Arg-Leu-Asp,
(b) Arg-Met-Val-Ser-Gly-Gln-Thr-Arg-Leu-Asp-Leu,
(c) Arg-Met-Val-Ser-Gly-Gln-Thr-Arg-Leu-Asp-Leu-Leu,
(d) Arg-Met-Val-Ser-Gly-Gln-Thr-Arg-Leu-Asp-Leu-Leu-Gln, and
(e) Arg-Met-Val-Ser-Gly-Gln-Thr-Arg-Leu-Asp-Leu-Leu-Gln-Arg,

wherein Gly represents glycine, and Arg, Met, Val, Ser, Gln, Thr, Leu, Asp, respectively represent the L-amino acid forms of arginine, methionine, valine, serine, glutamine, threonine, leucine, and aspartic acid.

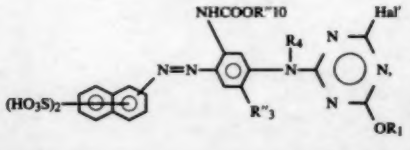
4,377,517

2-(C_{1-4}ALKOXY)CARBONYLAMINO-4-(2'-C_{1-4}ALKOXY-4'-HALO-1',3',5'-TRIAZINYL-6'-AMINO)-PHENYLAZONAPHTHALENEDISULFONIC ACIDS

Roland Mislin, Saint-Louis, France; Hanspeter Uehlinger, Basel, and Max Oppliger, Allschwil, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Jun. 16, 1980, Ser. No. 159,952
Int. Cl.³ C09B *62/085*; D06P *1/382, 3/10*
U.S. Cl. 260—153 **6 Claims**

1. A compound of the formula



or a salt thereof each cation of which is non-chromophoric, wherein

R_1 is C_{1-4}alkyl,
R_3'' is hydrogen, methyl or methoxy,
R_4 is hydrogen or C_{1-4}alkyl,
R_{10}' is C_{1-4}alkyl, and
Hal' is fluoro or chloro.

4,377,518

AZO DYESTUFFS DERIVED FROM POLYCYCLO-HETERCYCLIC COUPLER COMPONENTS

Dieter vor der Brück, Bonn, and Hans-Joachim Kabbe, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

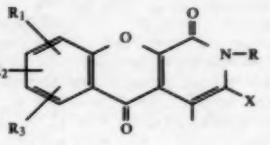
Filed Sep. 3, 1980, Ser. No. 183,872
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1979, 2935720
Int. Cl.³ C09B *29/36*; 30/C *107/04*
U.S. Cl. 260—156 **8 Claims**

1. Dyestuffs of the formula

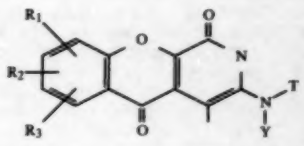
I

in which

D represents the radical of a diazo component and
A represents the radical of a coupling component of the formula



or



wherein

R_1, R_2 and R_3 represent hydrogen or non-ionic radicals,
R represents hydrogen or an optionally substituted alkyl, cycloalkyl, aryl, aralkyl or heterocyclic radical,
X represents OH or

T represents the remaining members of a fused-on ring and
Y and Z represent hydrogen, optionally substituted alkyl or optionally substituted aryl.

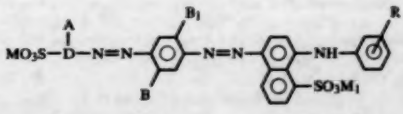
4,377,519

NAVY BLUE WATER-SOLUBLE SULFOPHENYL- OR SULFONAPHTHYL-AZO-1,4-PHENYLENE-AZO-5-(8-ANILINONAPHTHALENE-1-SULFONIC ACID) DYES FOR POLYAMIDES

Hans A. Stingl, Toms River, N.J., assignor to Toms River Chemical Corporation, Toms River, N.J.

Continuation of Ser. No. 943,427, Sep. 18, 1978, abandoned, which is a continuation of Ser. No. 768,516, Feb. 14, 1977, abandoned. This application Sep. 11, 1980, Ser. No. 186,040
Int. Cl.³ C09B *31/057*; D06P *1/39, 3/24*
U.S. Cl. 260—190 **7 Claims**

1. A dye of the structure



wherein
D is a phenylene or a naphthalene group,
A is H, Cl, Br, lower alkyl, or lower alkoxy,
B is H, lower alkyl, or lower alkoxy,
B_1 is lower alkyl or lower alkoxy,
R is H, Cl, Br, lower alkyl, or lower alkoxy, and
M and M_1 are H, Na, K, NH_4, or Li.

4,377,520

CITRUS OIL CONTAINING A HIGH CONCENTRATION OF CAROTENOID PIGMENTS AND METHOD FOR PRODUCING SAME

Tony M. Howell, Apopka, and Carl F. Huffman, Maitland, both of Fla., assignors to The Coca-Cola Company, Atlanta, Ga.

Continuation of Ser. No. 152,545, May 23, 1980, abandoned. This application Jan. 11, 1982, Ser. No. 338,740
Int. Cl.³ C11B 9/00; A23L 1/27, 1/212
U.S. Cl. 260—236.6 27 Claims

1. A process for producing a citrus oil which contains a high concentration of carotenoid pigments, comprising:
(a) providing a citrus fruit having a flavedo which contains peel oil sacs and carotenoid-containing chromoplasts;
(b) abrading the flavedo away from the remainder of the citrus fruit, thereby rupturing a substantial number of carotenoid-containing chromoplasts and peel oil sacs and forming a mash containing flavedo particles, peel oil, and water, wherein said abrading comprises contacting the flavedo with either a rotating grinding wheel, a rotating carborundum roll, or a rotating wire brush wheel;
(c) combining said mash with a solid dehydrating agent to form a pressable mixture, wherein said dehydrating agent is an inorganic salt, said salt being capable of incorporating water as bound water of hydration to form a non-hardening hydrated salt, and further wherein said salt is added in an amount sufficient to dehydrate said mash to a substantial extent;
(d) allowing said mixture of mash and inorganic salt to stand until the water present in said mash is absorbed by the salt and is incorporated in said mixture as a hydrated species and further until a substantial amount of carotenoid pigments in said chromoplasts are dissolved in said peel oil; and
(e) pressing said substantially dehydrated mixture to express said citrus oil, which contains a high concentration of carotenoid pigments, and leave a mash press cake.

7. A citrus oil produced by the process as set forth in claim 1.

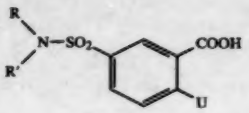
4,377,521

SULFAMYLBENZOIC ACIDS

Gerald F. Holland, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 958,939, Nov. 8, 1978, abandoned, which is a division of Ser. No. 802,498, Jun. 1, 1977, Pat. No. 4,138,399, which is a division of Ser. No. 713,412, Aug. 11, 1976, Pat. No. 4,124,590, which is a division of Ser. No. 481,195, Jun. 20, 1974, Pat. No. 3,992,441, which is a division of Ser. No. 318,213, Dec. 26, 1972, Pat. No. 3,843,662, which is a continuation-in-part of Ser. No. 206,514, Dec. 9, 1971, abandoned, which is a continuation-in-part of Ser. No. 72,156, Sep. 14, 1970, abandoned. This application Jan. 4, 1980, Ser. No. 109,640
Int. Cl.³ C07D 265/30, 279/12
U.S. Cl. 260—239 BA 10 Claims

1. A compound selected from the group consisting of those of the formula



and the amides, lower alkyl esters and salts thereof with pharmacologically acceptable bases, wherein
U is selected from the group consisting of chloro, fluoro, bromo and di-lower-alkylamino; and
R and R′ together with the nitrogen to which they are attached form a heterocyclic ring selected from the group consisting of morpholino, thiomorpholino, piperazinyl, 3-azabicyclo[3,2,2]-nonanyl, tetrahydroisoquinolyl, tetrahydropyridyl and mono- and disubstituted derivatives of said heterocyclic rings;
said substituents being selected from the group consisting of alkyl, alkyloxy and alkyloxyalkyl of one to four carbon atoms in each alkyl group, hydroxy, chloro, bromo, trifluoromethyl, phenyl, tolyl, benzyl, benzyloxy, chloromethyl and hydroxymethyl.

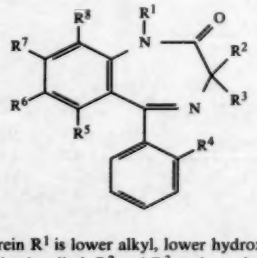
4,377,522

BENZODIAZEPINE DERIVATIVES

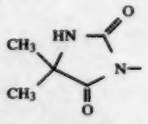
Quirico Branca, Basel; Albert E. Fischli, and Andre Szente, both of Riehen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jul. 6, 1981, Ser. No. 280,644
Claims priority, application Switzerland, Jul. 31, 1980, 5842/80
Int. Cl.³ C07D 243/24
U.S. Cl. 260—239.3 D 13 Claims

1. A compound of the formula



wherein R^1 is lower alkyl, lower hydroxyalkyl or lower dialkylaminoalkyl, R^2 and R^3 each are lower alkyl, R^4 is halogen, R^5, R^7 and R^8 each are hydrogen or halogen and R^6 is nitro, amino, lower alkylamino, lower dialkylamino or a group of the formula $H_2N—C(CH_3)_2—CO—NH—$, $R^9R^{10}N—CO—NH—$ or



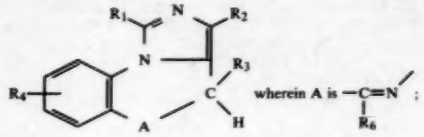
and either R^9 is hydrogen or lower alkyl and R^{10} is lower alkyl or lower hydroxyalkyl or R^9 and R^{10} together with the nitrogen atom are a heterocycle selected from the group consisting of aziridin-1-yl, pyrrolidin-1-yl, 4-methyl-piperazin-1-yl and morpholin-4-yl
and their pharmaceutically acceptable acid addition salts.

4,377,523
IMIDAZODIAZEPINES AND PROCESSES THEREFOR

Armin Walser, West Caldwell, and Rodney I. Fryer, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 905,820, May 15, 1978, Pat. No. 4,280,957, which is a continuation of Ser. No. 663,660, Mar. 4, 1978, abandoned, which is a continuation-in-part of Ser. No. 602,691, Aug. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 504,924, Sep. 11, 1974, abandoned. This application Mar. 12, 1981, Ser. No. 243,092
Int. Cl.³ C07D *487/04*
U.S. Cl. 260—244.4 1 Claim

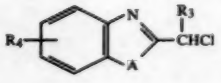
1. A process for producing a compound of the formula



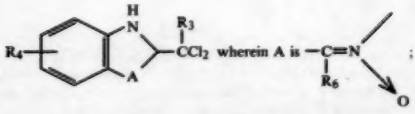
wherein A is ;

R_1 is selected from the group consisting of hydrogen, lower alkyl, phenyl, pyridyl, tolyl, and alkoxy lower alkyl; R_2 is hydrogen; R_3 is selected from the group consisting of hydrogen and lower alkyl; R_4 is selected from the group consisting of hydrogen, halogen, trifluoromethyl, lower alkyl, and lower alkanoyl; R_6 is selected from the group consisting of phenyl, mono-halo or mono-nitro substituted phenyl, di-halo or halo-nitro substituted phenyl, pyridyl and mono-halo or mono-nitro substituted pyridyl which comprises the following steps in combination

(a) reacting a compound selected from the group consisting of



and



wherein A is ;

and R_3, R_4 and R_6 are as above with nitromethane in the presence of a strong base;

(b) catalytically hydrogenating with Raney nickel in the presence of hydrogen the product from (a);

(c) acylating the product from (b) with an acid halide or an acid anhydride of the formulas R_1COX or $(R_1CO)_2O$ respectively wherein R_1 is as above;

(d) cyclizing the product from (c) with a dehydrating agent selected from the group consisting of phosphorous pentoxide, polyphosphoric acid or an acid catalyst;

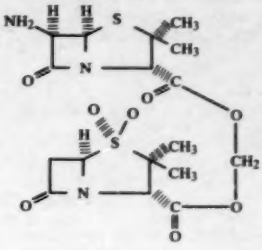
(e) dehydrogenating the cyclized product of (d) with a compound selected from the group consisting of manganese dioxide, potassium permanganate or palladium on carbon.

4,377,524
BIS-ESTERS OF METHANEDIOL WITH PENICILLINS AND PENICILLANIC ACID 1,1-DIOXIDE

Eric C. Bigham, Chapel Hill, N.C., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 39,539, May 16, 1979, Pat. No. 4,244,951. This application Sep. 8, 1980, Ser. No. 185,090
Int. Cl.³ C07D *499/00*; A61K *31/425*
U.S. Cl. 260—245.2 R 3 Claims

1. The compound of the formula



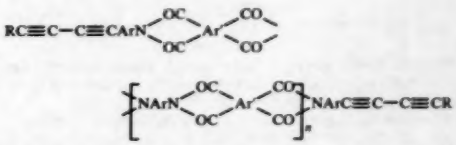
and the acid-addition salts thereof.

4,377,525
ADDITION PRODUCTS OF DI-ACETYLENE-TERMINATED POLYIMIDE DERIVATIVES AND A DIENOPHILE HAVING A TERMINAL VINYL GROUP

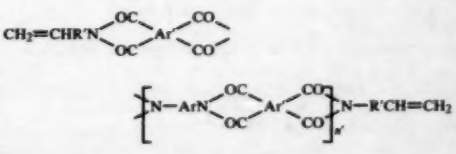
Gaetano F. D'Alelio, deceased, late of South Bend, Ind. (by St. Joseph Bank and Trust Company, executor), and Phillip A. Waitkus, Sheboygan, Wis., assignors to Plastics Engineering Company, Sheboygan, Wis.

Continuation-in-part of Ser. No. 199,610, Oct. 22, 1980, abandoned. This application Mar. 2, 1982, Ser. No. 353,865
Int. Cl.³ C07D *209/34, 471/00*; C08F *22/40*
U.S. Cl. 548—461 16 Claims

1. The Diels-Alder addition product of (1) a conjugated diacetylene compound of the formula:



and (2) a dienophile of the formula:



wherein:

Ar' is a tetravalent aromatic organic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to the adjacent carbon atoms in Ar' except in the case of Ar' being a naphthalene radical, one or both pairs of the carbonyl groups may be attached to peri-carbon atoms;

Ar is a divalent aromatic organic radical;

n is zero or an integer having a value of one to 20;

n' is zero or an integer having a value of one to 20;
R is hydrogen or an organic moiety containing 1 to 21 carbon atoms; and
R' is a divalent organic moiety containing 1 to 12 carbon atoms.

4,377,526

METHOD OF PURIFYING EICOSAPENTAENOIC ACID AND ITS ESTERS

Takao Fujita, and Masahiro Makuta, both of Hachioji, Japan, assignors to Nippon Suisan Kaisha, Ltd., Tokyo, Japan

Filed Dec. 11, 1981, Ser. No. 329,883
Claims priority, application Japan, May 15, 1981, 56-73168; Jul. 3, 1981, 56-103207
Int. Cl.³ B01D 3/34
U.S. Cl. 260—424 14 Claims

1. A method of purifying eicosapentaenoic acid and esters of eicosapentaenoic acid, comprising:
treating a mixture containing eicosapentaenoic acid or an ester of eicosapentaenoic acid with urea, wherein said treating comprises contacting said mixture with a polar organic solvent and urea so that a solution containing said acid or ester and urea is formed, precipitating urea crystals from said solution, and removing said crystals from said solution; and
fractionally distilling said mixture.

4,377,527

AMMONIA CATALYZED PREPARATION OF ZINC DIHYDROCARBYL DITHIOPHOSPHATES

Albert R. Sabol, Munster, Ind., and Nicolas C. Petrellis, Lisle, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Mar. 9, 1981, Ser. No. 242,107
Int. Cl.³ C07F 3/06
U.S. Cl. 260—429.9 13 Claims

1. An improved process for the preparation of a zinc dihydrocarbyl dithiophosphate composition that provides lubricants with resistance to corrosion, wear and oxidation, which comprises reacting a dihydrocarbyl dithiophosphoric acid, a zinc compound and an effective neutralization reaction catalytic amount of ammonia or an ammonia-yielding compound.

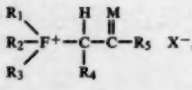
4,377,528

GROUP VA SALTS AND PROCESS FOR PREPARING SAME

David L. Beach, Gibsonia, and James J. Harrison, Glenshaw, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 179,079, Aug. 18, 1980, Pat. No. 4,293,502, Ser. No. 179,080, Aug. 18, 1980, Ser. No. 179,076, Aug. 18, 1980, Pat. No. 4,293,727, and Ser. No. 179,005, Aug. 18, 1980, Pat. No. 4,310,716. This application Nov. 24, 1980, Ser. No. 209,673
Int. Cl.³ C07F 9/70, 9/72, 9/90, 9/50
U.S. Cl. 260—440 29 Claims

1. A Group VA salt defined by the following formula:



wherein R_1, R_2, R_3, R_4 and R_5 are either alike or different members selected from the group consisting of hydrogen, alkyl radicals having from about one to about 24 carbon atoms, aryl radicals having from about six to about 20 carbon atoms, alkenyl radicals having from about two to about 30 carbon atoms, cycloalkyl radicals having from about three to about 40 carbon atoms, aralkyl and alkaryl radicals having from about six to about 40 carbon atoms, hydrocarbyl groups carrying halogen, hydroxyl, alkoxy or aryloxy, or an alkyl, aryl, alkenyl, cycloalkyl, aralkyl or alkaryl group carrying a sulfonato group, provided that at least one of R_1, R_2 and R_3 is an alkyl, aryl, alkenyl, cycloalkyl, alkaryl or aralkyl carrying a sulfonato group; M is sulfur or oxygen; F is phosphorus, arsenic or antimony; X is a halogen radical, a tosyl group or an acetate group; and further provided that F is bonded to the groups R_1, R_2 and R_3 through carbon.

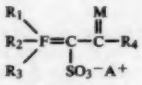
4,377,529

SULFONATED GROUP VA YLIDES AND PROCESS FOR PREPARING SAME

David L. Beach, Gibsonia, and Harrison, James J., Glenshaw, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 179,079, Aug. 18, 1980, Pat. No. 4,293,502, and Ser. No. 179,078, Aug. 18, 1980, and Ser. No. 179,076, Aug. 18, 1980, Pat. No. 4,293,727, and Ser. No. 179,005, Aug. 18, 1980, Pat. No. 4,310,716. This application Nov. 24, 1980, Ser. No. 209,674
Int. Cl.³ C07F 9/70, 9/72, 9/90, 9/50
U.S. Cl. 260—440 46 Claims

1. A Group VA ylide defined by the following formula:



wherein R_1, R_2, R_3, and R_4 are either alike or different members selected from the group consisting of hydrogen, alkyl radicals having from about one to about 24 carbon atoms, aryl radicals having from about six to about 20 carbon atoms, alkenyl radicals having from about two to about 30 carbon atoms, cycloalkyl radicals having from about three to about 40 carbon atoms, aralkyl and alkaryl radicals having from about six to about 40 carbon atoms, halogen radicals, hydroxyl, alkoxy, or aryloxy groups, hydrocarbyl groups carrying halogen, hydroxyl, alkoxy or aryloxy, and a sulfonato group or an alkyl, aryl, alkenyl, cycloalkyl, aralkyl or alkaryl group carrying a sulfonato group; M is sulfur or oxygen; F is phosphorus, arsenic or antimony; and A is the cationic residue of a base selected from the group consisting of an alkyl or aryl lithium, an alkoxide and a hydrocarbyl-substituted ammonium hydroxide.

4,377,530

MANUFACTURE OF ISOCYANATES

Steven L. Trenbeath, Fairfield; Allan M. Feldman, Norwalk, and Laurence J. Nummy, Stamford, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 5, 1982, Ser. No. 354,997
Int. Cl.³ C07C 118/00
U.S. Cl. 260—453 P 7 Claims

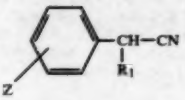
1. In the preparation of isocyanates by addition of isocyanic acid to an olefin in an inert solvent and in the presence of a catalyst effective to promote the reaction, the improvement which comprises establishing a reaction mass of isocyanic acid and inert solvent therefor at approximately atmospheric pressure and at a temperature between about 25° and 80° C. and adding the olefin to the reaction mass at a rate such that the molar proportion of remaining isocyanic acid to unreacted olefin is above about 25 to 1, while maintaining said temperature between 25° and 80° C. and maintaining the molarity of unreacted isocyanic acid in said mass between about 1 and about 6.

4,377,531
METHOD FOR THE ALKYLATION OF PHENYLACETONITRILES

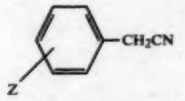
Charles P. Grasso, East Windsor, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Oct. 7, 1981, Ser. No. 309,301
Int. Cl.³ C07C 121/75, 121/66
U.S. Cl. 260—465 F 10 Claims

1. A method for the preparation of compounds of structural formula:



wherein Z is C_1–C_4 alkyl, C_1–C_3 alkoxy or halogen; R_1 is C_1–C_4 alkyl; comprising reacting one mole of a compound of the structural formula:



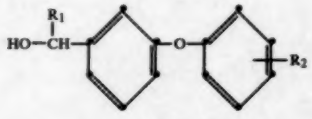
with from one to four moles of a compound of formula R_1–X, wherein Z and R_1 are as defined above and X is halogen, in the presence of from one to five moles of solid particulated potassium or sodium hydroxide at a temperature from 20° to 100° C. or at the reflux temperature of the mixture, until the reaction is essentially complete.

4,377,532
3-PHENOXYBENZYL COMPOUNDS

Peter Ackermann, Reinach; Laurenz Gsell, Basel, and Rudolf Wehrli, Rheinfelden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 19, 1982, Ser. No. 350,453
Claims priority, application Switzerland, Feb. 26, 1981, 1296/81; Nov. 9, 1981, 7169/81
Int. Cl.³ C07C 121/80, 121/75, 43/295, 47/575
U.S. Cl. 260—465 E 10 Claims

1. A 3-phenoxybenzyl alcohol of the formula



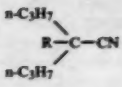
wherein R_1 is hydrogen, cyano, —$CSNH_2$, allenyl, C_2–C_3 alkenyl or C_2–C_3 alkynyl, and R_2 is alkenyl or alkynyl.

4,377,533
PROCESS FOR INTRODUCING ALKYL RADICALS INTO CARBON CHAINS HAVING A FUNCTIONAL GROUP AND COMPOUNDS PREPARED BY SAID PROCESS

Michel Bouisset; Michel Chignac, both of Sisteron; Claude Grain, Volonne, and Charles Pigerol, Saint-Ouen, all of France, assignors to Sanofi, Paris, France

Continuation-in-part of Ser. No. 209,895, Nov. 24, 1980, abandoned. This application Apr. 3, 1981, Ser. No. 250,852
Claims priority, application France, Dec. 7, 1979, 79 30039
Int. Cl.³ C07C 120/00, 121/16
U.S. Cl. 260—465.1 8 Claims

1. Process for preparing a nitrile of general formula:



I

in which R represents hydrogen or n-propyl, whereby n-propyl bromide and a nitrile of the formula:

II

in which R and R_1, which are the same or different, represent hydrogen or n-propyl, are placed in contact, both reactants being in the same anhydrous medium selected from benzene, toluene, cyclohexane, diisopropyl ether, tetrahydrofuran or a mixture of such solvents, at a temperature between −10° and +45° C., with a mixture composed of 2 parts of a sodium amide to 1 part of a sodium alcoholate, the latter being selected from sodium n-propylate, sodium isopropylate, sodium t-butylate and sodium 2-ethoxyethylate, and the resulting propylated nitrile separated from the reaction mixture.

4,377,534
PRODUCTION OF UNSATURATED NITRILES

Robert K. Grasselli, Chagrin Falls; Dev D. Suresh, Warrensville Heights, and Harley F. Hardman, Lyndhurst, all of Ohio, assignors to The Standard Oil Co., Cleveland, Ohio

Continuation of Ser. No. 881,313, Feb. 27, 1978, Pat. No. 4,327,037, which is a division of Ser. No. 430,964, Jan. 4, 1974, Pat. No. 4,139,552. This application Aug. 17, 1981, Ser. No. 293,822
The portion of the term of this patent subsequent to Apr. 27, 1999, has been disclaimed.
Int. Cl.³ C07C 120/14
U.S. Cl. 260—465.3 1 Claim

1. In the process for the ammoxidation of propylene or isobutylene by contacting propylene, isobutylene or mixtures thereof with molecular oxygen and ammonia is the vapor phase in the presence of a catalyst, the improvement comprising using as the catalyst a catalyst wherein the ratio of the elements is described by the empirical formula

$$Sb_aC_bD_cFe_dBi_eMo_{12}O_x$$

wherein

C is an alkali metal, thallium, indium, silver, copper, a rare earth metal, boron, phosphorus, arsenic or mixture thereof; and

D is nickel, cobalt, magnesium, cadmium, calcium, zinc, beryllium or mixture thereof; and

wherein

a is greater than zero to about 4;

b is greater than zero to 4;

c is 0.1 to about 20;

d and e are independently about 0.1 to about 10; and

x is the number of oxygens required to satisfy the valence requirements of the other elements present,

said catalyst containing cesium, wherein

C is at least cesium.

4,377,535

PROCESS FOR THE PREPARATION OF NITRO-T-ACID (8-NITRO-NAPHTHALENE-1,3,6-TRISULPHONIC ACID)

Reinhard Kaiser, Cologne; Horst Behre, Odenthal; Jürgen Dammann, Cologne; Rolf Pütter, Duesseldorf, and Axel Vogel, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 64,960, Aug. 8, 1979, abandoned. This application Dec. 24, 1980, Ser. No. 219,615

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1978, 2837498

Int. Cl.³ C07C *143/55*; C07B *11/00*

U.S. Cl. 260—505 C 1 Claim

1. In the process of the preparation of 8-nitro-naphthalene-1,3,6-trisulfonic acid by nitration of naphthalene-1,3,6-trisulfonic acid or mixture containing the latter with nitric acid in sulfuric acid the improvement comprising

(a) carrying out the nitration in continuous operation in a plurality of reactors of which the first reactor is a loop reactor;

(b) placing initially into the first reactor a nitration mixture in which naphthalene-1,3,6-trisulfonic acid has been nitrated to the extent of at least 80%;

(c) adding to this nitration mixture simultaneously while thoroughly mixing the reaction mixture and maintaining the reaction temperature in the range from 30° to 60° C. (i) naphthalene-1,3,6-trisulfonic acid or a mixture containing the latter dissolved in sulfuric acid having a temperature between 100° C. and 200° C. and (ii) 1.0 to 1.4 mols of nitric acid per mol of naphthalene sulfonic acid in such a manner that a sulfuric acid concentration in the range of 86 to 94% by weight relative to the sum of water and sulfuric acid present is maintained during the nitration;

(d) carrying out the nitration in the loop reactor to the extent of at least 80%;

(e) completing the nitration reaction by transferring the nitration mixture into a series of one or two stirred reactor vessels until reaction is complete; and

(f) then working up the completed reaction mixture in known manner.

4,377,536

POLYAMIDE DERIVATIVES HAVING UNSATURATED TERMINAL AMIC ACID GROUPS

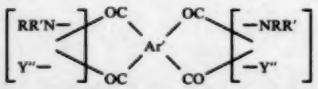
Phillip A. Waitkus, Sheboygan, Wis., and Gaetano F. D'Alelio, South Bend, Ind., assignors to Plastics Engineering Company, Sheboygan, Wis.

Division of Ser. No. 115,482, Jan. 25, 1981, Pat. No. 4,316,844. This application Nov. 16, 1981, Ser. No. 322,075

Int. Cl.³ C07C *101/68*

U.S. Cl. 260—544 N 19 Claims

1. A hemi-acid compound of the formula:



wherein:

Ar' is a tetravalent aromatic benzenoid moiety, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to adjacent carbon atoms in the Ar' moiety except that in the case of the Ar' being a naphthalene moiety one or both pairs of the carbonyl groups may be attached to peri carbon atoms;

R' is a non-acetylenic hydrocarbyl moiety or a plurality of said moieties connected by —O— or —SO_2 groups, said moiety or moieties totalling 2 to 14 carbon atoms and having a terminal —CH=CH structure;

R is a non-acetylenic hydrocarbyl moiety or a plurality of said moieties connected by —O— or —SO_2 groups, said moiety or moieties totalling one to 20 carbon atoms;

Y" is —OH or X; and

X is a halogen.

4,377,537

PREPARATION OF ALKANE PHOSPHONIC AND PHOSPHINIC ACID ARYL ESTERS

Hans-Dieter Block, Cologne, and Hans-Günther Fröhlen, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

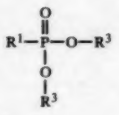
Filed Jan. 2, 1981, Ser. No. 222,221

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1980, 3001895

Int. Cl.³ C07F *9/32*

U.S. Cl. 260—969 2 Claims

1. A process for the preparation of a phosphonic acid diaryl ester of the formula

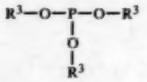


wherein

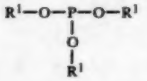
R^1 is a C_1–C_{20} alkyl or alkenyl group, and

R^3 is a C_6–C_{10} aryl group,

comprising reacting a triaryl phosphite of the formula

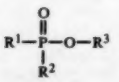


with approximately half the molar amount of an alkyl phosphite of the formula



in the presence of an Arbusow catalyst at a temperature from about 170° to 300° C.

2. A process for the preparation of a phosphinic acid aryl ester of the formula



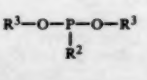
wherein

R^1 is a C_1–C_{20} alkyl or alkenyl group,

R^2 is a C_1–C_{20} alkyl or alkenyl group or an aryl group, and

R^3 is a C_6–C_{10} aryl group,

comprising reacting a phosphonous acid diaryl ester of the formula



with approximately an equimolar amount of a phosphonous acid dialkyl ester of the formula

$$R^1—O—\underset{\displaystyle R^2}{\underset{|}{P}}—O—R^1$$

in the presence of an Arbusow catalyst at a temperature from about 170° to 300° C.

4,377,538

VARIABLE VENTURI TYPE CARBURETOR

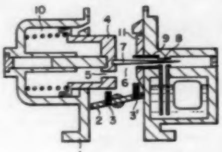
Satomi Wada, Ohbu, Japan, assignor to Aisan Industry, Co., Ltd., Aichi, Japan

Filed Jun. 25, 1981, Ser. No. 277,361

Claims priority, application Japan, Jul. 11, 1980, 55-98361[U]

Int. Cl.³ F02M *9/06*

U.S. Cl. 261—44 C **5 Claims**



1. In a variable venturi carburetor having a suction piston adapted to be moved back and forth in accordance with changes in the flow rate of intake air so as to change the area of a venturi portion adjacent thereto into which fuel is discharged, and a throttle valve provided at a downstream side of said suction piston, the improvement comprising

means comprising two fuel introduction ports in said throttle valve provided at the downstream side of said suction piston, said fuel introduction ports including two tubes and having upstream side openings respectively extending through said tubes defining extended ends thereof respectively, and disposed such that when an open position of said throttle valve is such that a degree of opening thereof is relatively small, the extended end of one of said ports is directed toward a side wall of said suction piston to which discharged fuel attaches, and the extended end of the other of said ports is directed toward a carburetor wall opposing said suction piston, the discharged fuel also attaching to said carburetor wall.

4,377,539

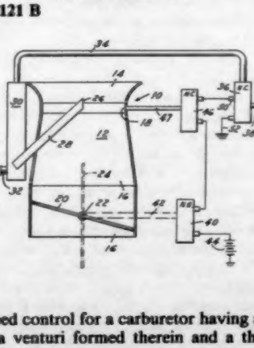
CARBURETOR AIR BLEED CONTROL

David C. Irish, Livonia, and John G. Bathe, Jr., Taylor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 28, 1982, Ser. No. 343,669

Int. Cl.³ F02M *7/24*

U.S. Cl. 261—121 B **3 Claims**



1. An air bleed control for a carburetor having an induction passage with a venturi formed therein and a throttle valve downstream thereof rotatably mounted for variable movement between closed and wide open positions, a fuel passage connected to the venturi for the induction of fuel thereinto, an air bleed passage operably connected to the fuel passage to at times bleed the venturi vacuum signal acting on the fuel to thereby decrease the flow of fuel, and control means responsive to the position of the throttle valve and the air flow through the induction passage to control the bleed of air into the air bleed passage, the control means including a normally closed solenoid operated open-close valve controlling the admission of air to the air bleed passage, a source of electrical energy, and a normally open throttle valve operated switch movable to a closed position upon movement of the throttle valve to a wide open throttle position to complete the circuit between the source and open-close valve to open the latter valve and bleed air into the fuel passage.

4,377,540

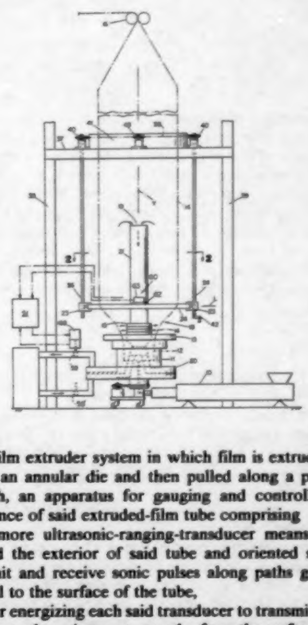
CONTROL OF TUBULAR FILM SIZE

Ronald D. Cluett, Gloucester, and Richard L. Mitchell, Manchester, both of Mass., assignors to Gloucester Engineering Co., Inc., Gloucester, Mass.

Filed Aug. 24, 1981, Ser. No. 295,648

Int. Cl.³ B29D *7/22*

U.S. Cl. 264—23 **17 Claims**



1. In a film extruder system in which film is extruded as a tube from an annular die and then pulled along a predetermined path, an apparatus for gauging and controlling the circumference of said extruded-film tube comprising

one or more ultrasonic-ranging-transducer means spaced around the exterior of said tube and oriented so as to transmit and receive sonic pulses along paths generally normal to the surface of the tube,

means for energizing each said transducer to transmit a sonic pulse to and receive a return pulse from the surface of said tube,

means associated with each transducer for generating a range signal representative of the time required for said pulse to travel to and from said tube, and

means responsive to said range signals for varying the quantity of air within said tube for controlling the tube diameter.

12. In a film extruder system in which film is extruded as a tube from an annular die and then pulled along a predetermined path, a method for gauging and controlling the circumference of said extruded-film tube comprising the steps of

disposing one or more ultrasonic-ranging-transducer means around the exterior of said tube and orienting them so as to

transmit and receive sonic pulses along paths generally normal to the surface of the tube,

performing a measurement cycle in which each said transducer transmits a sonic pulse to and receives a return pulse from the surface of said tube,

generating a range signal representative of the time required for said pulse to travel to and from said tube, and

varying the quantity of air within said tube in response to said range signals in order to control the tube diameter.

4,377,541

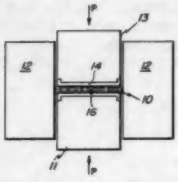
PROCESS FOR PREPARING LOW VOLTAGE VARISTORS

Carl F. Bobik, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 21, 1978, Ser. No. 935,589

Int. Cl.³ H01F *41/02*

U.S. Cl. 264—56 **9 Claims**



1. In a method of forming a varistor comprising compressing a suitable powder in a die to a compact body having at least one recess, and sintering said body, the improvement comprising fitting a pressing surface in the die containing the powder with a resilient material having as part thereof at least one resilient protrusion, which during pressing imparts a depression into the surface of said powder to produce a region of reduced thickness in said compact body opposite said protrusion, said protrusion deforming during said pressing operation and returning to its undeformed shape as the compression is released.

4,377,542

METHOD OF FORMING A DENSIFIED SILICON NITRIDE ARTICLE

John A. Mangels, Flat Rock, and John R. Baer, Ypsilanti, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 21, 1981, Ser. No. 333,243

Int. Cl.³ C04B *35/58*

U.S. Cl. 264—65 **2 Claims**

1. A method of forming a densified silicon nitride article which comprises:

forming a reaction bonded article of moderate density, said reaction bonded article having a primary phase of substantially pure grains of silicon nitride surrounded by a secondary grain boundary phase which contains silicon nitride, silicon dioxide and a yttrium oxide densification aid incorporated in the reaction bonded article of moderate density either in their pure forms or interacted with one another;

packing said reaction bonded silicon nitride article of moderate density in a packing powder which contains 15 weight percent SiO_2, 9 weight percent Y_2O_3, 25 weight percent BN and 51 weight percent silicon nitride; and

heating said reaction bonded article of moderate density in said packing powder in a nitrogen pressure of 0.206 MPa for four hours at 1900° C. and in a nitrogen pressure of 2.06 MPa for two hours at 1950° C., whereby interaction of said secondary grain boundary phase may take place with the pure compounds contained in said packing powder whereby a new grain boundary phase is developed about the substantially pure grains of silicon nitride, which new grain boundary phase is a unitary phase of $Y_2Si_2O_7$.

4,377,543

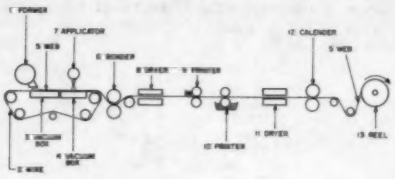
STRENGTH AND SOFTNESS CONTROL OF DRY FORMED SHEETS

Irene B. Strohbeen, Appleton, and James H. Dinius, Neenah, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 13, 1981, Ser. No. 310,949

Int. Cl.³ D04H *1/64*

U.S. Cl. 264—120 **10 Claims**



1. In a process for forming an air laid web of wood pulp fibers comprising the steps of:

(a) airlaying wood pulp fibers onto a moving foraminous carrier to form a substantially dry and uncompacted web of randomly deposited fibers,

(b) applying water to the web of step (a),

(c) pressure bonding the water treated web of step (b) to provide dry strength,

(d) drying the pressure bonded web of step (c),

(e) applying adhesive to the dried web of step (d) to provide increased wet strength and coincidentally dry strength, and

(f) drying the web of step (e) to form a web with both wet and dry strength,

the improvement comprising:

controlling the softness and strength of the web of step (f) by adding a chemical softening agent to the water applied to the web in step (b) above.

4,377,544

MANUFACTURE OF A TEXTILE-LIKE RETICULAR PRODUCT FROM THERMOPLASTIC FILM

Ole-Bendt Rasmussen, Mundschopfiweg 2, CH-6318 Walchwil/-Zug, Switzerland

Continuation of Ser. No. 179,708, Aug. 20, 1980, abandoned, which is a continuation of Ser. No. 7,713, Jan. 30, 1979, abandoned, which is a continuation of Ser. No. 841,480, Oct. 12, 1977, abandoned, which is a continuation of Ser. No. 639,007, Dec. 9, 1975, abandoned. This application Jul. 20, 1981, Ser. No. 284,685

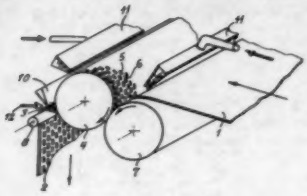
Claims priority, application United Kingdom, Dec. 10, 1974, 53268/74

Int. Cl.³ B29C *17/02*; B29D *27/00*

U.S. Cl. 264—139 **11 Claims**

1. A process for the direct conversion of thermoplastic film material into open-work sheet material having fibers on one surface thereof, which comprises the steps of maintaining one surface of a length of such film material into face-to-face contact with a surface capable of adhering to said thermoplastic material when the latter is in molten condition, while said surface is heated in a pattern of heated surface regions separated by unheated surface regions to a temperature above the melting point of the film material; continuing the contact between the film surface and the selectively heated surface for a time sufficient to selectively melt the film areas contacting said heated surface regions, whereby said melted film areas adhere to said surface regions, while the remaining film areas remain in generally unmelted and nonadhering condition; then sepa-

rating said selectively molten film from contact with said selectively heated surface whereby the molten adhering film areas are drawn out from the remainder of the film as fiber-like projections extending from the surrounding unmelted margins



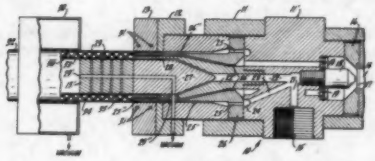
and thereby create apertures in said film generally corresponding to said heated surface regions; and directing a flow of cooling air toward the surfaces undergoing each separation to control the drawing of said fiber-like projections.

4,377,545

METHOD OF MAKING CORRUGATED REINFORCED THERMOPLASTIC PIPE

Robert L. Hornbeck, Mineral Wells, W. Va., assignor to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Filed Jun. 16, 1981, Ser. No. 274,119
Int. Cl.³ D01D 5/20
U.S. Cl. 264—167 **1 Claim**



1. A method of making a rigid, stiff, reinforced thermoplastic pipe made of spaced interior and exterior tubes and having spacing and bracing means therebetween comprising, extruding through multiple and separate die passages of a pipe shaping tool at one die passage at a first speed and a first thermoplastic material forming the interior tube, and at a second die passage a second thermoplastic material forming the exterior tube of said pipe while simultaneously forming a space therebetween, and further extruding through a third die passage a third thermoplastic material in the form of a ribbon into said space at a speed faster than said first speed whereby said ribbon buckles, contacts the inner diameter of the exterior tube and the outer diameter of the interior tube and forms a corrugated-like surface which acts as said spacing and bracing means between said interior and exterior tubes.

4,377,546

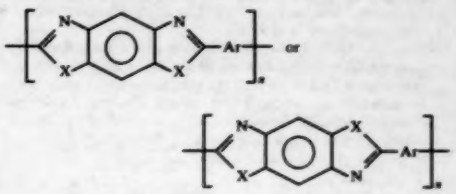
PROCESS FOR PRODUCING AROMATIC HETEROCYCLIC POLYMER ALLOYS

Thaddeus E. Helminiak, Dayton; Charles L. Benner, Fairborn; Fred E. Arnold, Centerville, and George Husman, Dayton, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

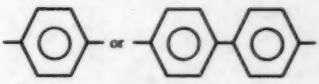
Filed Aug. 11, 1981, Ser. No. 291,891
Int. Cl.³ B29D 7/20
U.S. Cl. 264—232 **3 Claims**

1. A method for preparing a molecular composite film comprising the steps of:

A. forming a solvent mixture composed of (1) about 70 to 99 weight percent of methanesulfonic acid and (2) about one to 30 weight percent of a polymer mixture composed of (a) about 5 to 50 percent of a rod-like, aromatic, heterocyclic polymer and (b) about 50 to 95 weight percent of an amorphous, coil-like, aromatic, heterocyclic polymer; said rod-like, heterocyclic polymer consisting essentially of repeating units having the following structural formula:

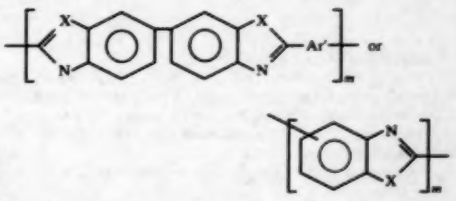


Wherein X is NH, Nϕ, O or S, where ϕ is phenyl, and Ar is

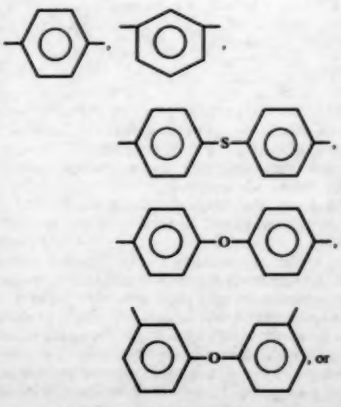


and n is an interger having a value such that the polymer has an intrinsic viscosity of about 5 to 30 dl/g as determined in methanesulfonic acid at 30° C.; and

said coil-like, heterocyclic polymer consisting essentially of repeating units having the following structural formula:



Wherein x is NH, Nϕ, O or S, where ϕ is phenyl and Ar′ is



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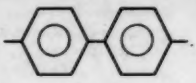


and m is an integer having a value such that the polymer has an intrinsic viscosity of about 2 to 20 dl/g as determined in methanesulfonic acid at 30° C.;

B. introducing said solvent mixture into a casting mold positioned within an enclosed chamber containing water vapor;

C. permitting said solvent mixture to absorb said water vapor for a period of time sufficient to form a precipitated film;

D. recovering said precipitated film from said mold; and

E. drying the recovered film.

4,377,547

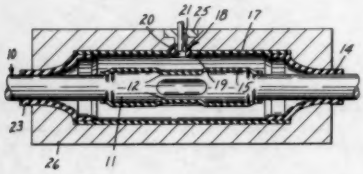
MOLDED HIGH VOLTAGE SPLICE BODY

Harold C. Hervig, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 18, 1982, Ser. No. 340,513

Int. Cl.³ B29C *5/00*; B29D *3/00*

U.S. Cl. 264—262 **3 Claims**



1. A method for making a molded high voltage splice body comprising the steps of

positioning a conductive elastomeric electrode on a mandrel,

providing an extruded, resiliently expandable, conductive elastomeric sleeve with a reinforced injection insert,

positioning the elastomeric sleeve over the elastomeric electrode on the mandrel,

sealing the ends of the elastomeric sleeve around the mandrel,

placing the mandrel with the electrode and sleeve on it into a mold,

injecting a curable insulating compound through the reinforced injection insert between the electrode and the sleeve under pressure to expand the sleeve against the interior of the mold and to force the insulating compound into intimate contact with the exterior of the electrode and the interior of the sleeve, and

curing the insulating compound.

4,377,548

METHOD FOR ENCAPSULATING A RADIAL LEADED ELECTRICAL COMPONENT

Ralph E. Pierpont, Kennebunk, Me., assignor to Sprague Electric Company, North Adams, Mass.

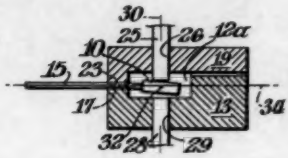
Filed Nov. 27, 1981, Ser. No. 325,464

Int. Cl.³ B29C *6/04*

U.S. Cl. 264—265 **7 Claims**

6. A method for transfer molding a radial leaded electrical component including placing the body of said component in a recess of a first piece of a split mold with said radial leads extending from said body mutually parallel in slots provided therefor in the perimeter of said mold, placing at least a second piece of said split mold in mating relationship with said first piece to form a cavity and to grip said leads and entomb said component body supported by said leads within said cavity, and introducing under pressure into said cavity a hot liquid molding resin, opening said mold and removing said encapsulated component, wherein the improvement comprises:

after said entombing of said body and prior to said introducing said hot resin, pushing perpendicularly to the plane of said leads a first blunt pin through a hole provided therefor in said first mold piece to push said body substantially



beyond the center position of said cavity, withdrawing said first pin, then pushing in the opposite direction from said first pin a second blunt pin through a hole provided therefor in another piece of said mold toward said body to deflect said body beyond said center position, and withdrawing said second pin to cause said leads-supported body to spring back into said center position.

4,377,549

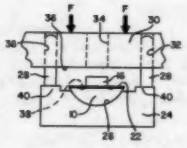
METHOD FOR FINISH FORMING THERMOPLASTIC SURFACES

Alistair G. Taig, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed May 11, 1981, Ser. No. 262,352

Int. Cl.³ B29C *13/00*

U.S. Cl. 264—320 **1 Claim**



1. A method for forming a thermoplastic coating on an article comprising the steps of:

(a) providing the article with the thermoplastic coating on the outer surface thereof, said thermoplastic coating being applied to said article when said article is heated and in excess of the desired coating for a finished surface for said article, and said article being provided with a recess partially filled with said thermoplastic coating;

(b) providing a die having a finishing surface thereon which is complementary to the contour for said article;

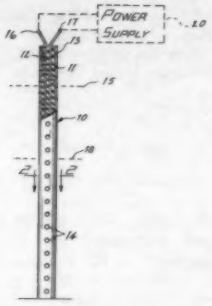
(c) heating said finishing surface to a temperature between the softening and melting temperatures of said thermoplastic coating;

(d) pressing said finishing surface against said thermoplastic coating to cause said thermoplastic coating to flow within a clearance defined between said finishing surface and said article, and the excess thermoplastic coating flows to said article recess to substantially fill the latter whereby a uniform thickness of thermoplastic coating is provided over said article apart from said recess in order to define a finished surface for said thermoplastic coating.

4,377,550
HIGH TEMPERATURE LIQUID LEVEL SENSOR

Richard D. Tokarz, West Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 29, 1981, Ser. No. 229,498
Int. Cl.³ G01F 23/24
U.S. Cl. 376—245 6 Claims



1. A high temperature liquid level sensor, comprising:
an upright length of metal sheathed metallic oxide cable having two interior conductors arranged parallel to one another and spaced apart by metallic oxide insulation, the materials comprising the sheath and conductors having melting temperatures above that of the highest expected temperature at the location being monitored;
output terminal means at the upper ends of the two conductors for operative attachment to resistance measuring equipment;
and a plurality of discrete perforations formed through the sheath and spaced elevationally along the height of the sheath for providing liquid communication between the cable insulation and the environment outside the cable.

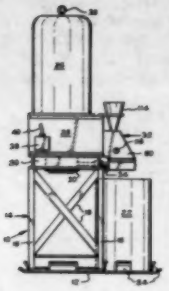
5. A process for sensing liquid level at very high temperatures in a liquid cooled nuclear reactor, comprising the following steps:
submerging a length of perforated metal sheathed cable having two interior conductors and metallic oxide insulation in an upright position along the elevation to be monitored;
and measuring the resistance across the upper ends of the conductors.

4,377,551
INCORE CUTTING MACHINE

William E. Adams, South Haven, Mich., assignor to Consumers Power Company, Jackson, Mich.

Filed Sep. 2, 1980, Ser. No. 183,200
Int. Cl.³ G21C 19/00
U.S. Cl. 376—260 9 Claims

1. Apparatus for shearing elongated radioactive members into short lengths while located within a water shield comprising, in combination, a frame adapted to be supported within a water shield pool, a vertically oriented elongated member feed path defined on said frame having upper, central and lower regions, an upwardly opening intake funnel mounted on said frame defining said feed path upper region, a pair of feed rollers rotatably mounted on said frame having peripheral portions located in opposed relationship within said feed path central region below said funnel and in alignment therewith whereby an elongated member within said central region engages said peripheral portions and is axially translated by said rollers, a shear movably mounted on said frame below said rollers and movable through said feed path lower region, electric motor means mounted on said frame, and transmission means mounted on said frame driven by said electric motor means operatively connected to and driving said feed rollers and shear whereby elongated members inserted into said intake

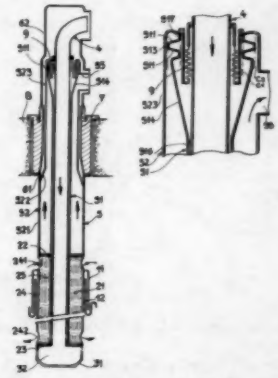


funnel are moved through said feed path by said rollers and severed into short lengths by said shear.

4,377,552
NUCLEAR REACTOR EXCHANGER

Philippe Doublet, La Varenne, and Georges Jullien, St Michel sur S/Orge, both of France, assignors to Novatome, Le Plessis Robinson, France

Filed Dec. 6, 1979, Ser. No. 100,873
Claims priority, application France, Dec. 12, 1978, 78 34945
Int. Cl.³ G21C 15/02; F28F 7/00, 9/02
U.S. Cl. 376—405 5 Claims



1. A heat exchanger for a fast neutron reactor, comprising
(a) a bundle of tubes fixed at their ends to upper and lower tube plates each having the form of crown, said tubes being located between outer and inner sleeves for channeling a stream of primary sodium circulating around said tubes;
(b) an inlet tube passing inside said inner sleeve for leading a stream of secondary sodium to the inlets of said tubes, so that said secondary sodium circulates within said tubes;
(c) an inner tubular jacket surrounding the said inlet tube and an outer tubular jacket connected together at the top so as to form an annular chamber which channels said secondary sodium at the outlets from said tubes, said inner tubular jacket having a folded portion comprising at least one flank and forming at least one annular throat.

4,377,553

DUCT AND CLADDING ALLOY

Michael K. Korenko, Rockville, Md., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 28, 1980, Ser. No. 155,231
Int. Cl.³ C22C 30/00
U.S. Cl. 420—584 2 Claims

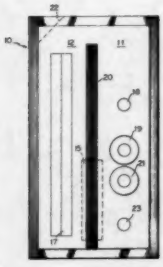
1. An austenitic alloy consisting essentially of
nickel—40%
chromium—10.5%
molybdenum—2.0%
silicon—0.5%
manganese—0.2%
zirconium—0.05%
titanium—3.3%
aluminum—1.7% carbon—0.03%
boron—0.005%
balance iron.

4,377,554

GENERATION OF MICROAEROPHILIC ATMOSPHERE

Raymond Johnson, Columbia, Md., assignor to Becton, Dickinson and Company, Paramus, N.J.

Filed Aug. 26, 1981, Ser. No. 296,104
Int. Cl.³ B01J 7/00
U.S. Cl. 422—239 6 Claims



1. A unitary package for generating a microaerophilic atmosphere comprising
(a) a flexible sealed package;
(b) material in a first compartment of said package for generating hydrogen, said hydrogen generating material being present in a stocihiometric amount sufficient to generate hydrogen to react with from about 20 to about 80 percent of the oxygen of a gas tight container into which the package is inserted.
(c) a second compartment in said package for receiving water, said second compartment being in fluid communication with said first compartment by means of a fluid channel; and
(d) flow restricting means in said fluid channel for establishing predetermined wet-over and condensation times when said package is broken and water is inserted in said compartment, said wet-over time being from about 1.5 to about 3 minutes and said condensation time being from about 10 to about 60 minutes.

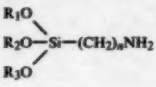
4,377,555

REMOVAL OF METAL FROM SOLUTION

Ronald D. Hancock, Weybridge, England, and Ian V. Howell, Porthcawl, Wales, assignors to The British Petroleum Company Limited, London, England

Filed Jul. 27, 1977, Ser. No. 819,560
Claims priority, application United Kingdom, Jul. 29, 1976, 31636/76
Int. Cl.³ B01D 15/00, 15/02
U.S. Cl. 423—6 7 Claims

1. A product, suitable for the removal of heavy metals, transition metals and actinide metals from solution, obtained by reacting (a) an inorganic solid containing surface hydroxyl groups with (b) a compound of formula (I)



(I)

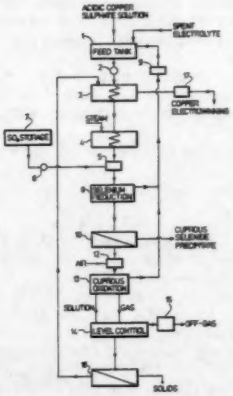
wherein R_1, R_2 and R_3, which may be the same or different, are organic radicals containing up to 20 carbon atoms, and n is an integer from 1 to 10, and (c) an aromatic ortho hydroxyaldehyde.

4,377,556

PROCESS FOR REMOVING DISSOLVED SELENIUM VALUES FROM AN ACIDIC AQUEOUS COPPER SULPHATE SOLUTION

Zoenek Hofirek, Rustenburg, South Africa, assignor to Sherritt Gordon Mines Limited, Toronto, Canada

Filed Apr. 9, 1982, Ser. No. 366,806
Int. Cl.³ C01G 3/10; C01B 19/04
U.S. Cl. 423—42 9 Claims



1. A process for removing dissolved selenium values from an acidic aqueous copper sulphate solution comprising treating the solution at a temperature of at least about 140° C. with a stoichiometric excess relative to the dissolved selenium of selenium-reducing compound selected from the group consisting of sulphur dioxide and a sulphite solution to produce a selenium-containing precipitate and dissolved cuprous copper, maintaining the temperature of the treated solution at at least about 140° C. and passing an oxygen-containing gas into the treated solution under a pressure of at least about 350 kPa to oxidize dissolved cuprous copper to dissolved cupric copper.

4,377,557
PROCESS FOR REMOVAL OF SULFUR OXIDES FROM WASTE GASES

Philip S. Lowell, Austin, Tex., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Nov. 23, 1981, Ser. No. 323,898
Int. Cl.³ C01B 17/00
U.S. Cl. 423—242 16 Claims

1. A method for the removal of sulfur dioxide from industrial waste gas containing same comprising:

(a) scrubbing said gas with an aqueous alkaline liquor, consisting essentially of a sorbent salt in which the cation is sodium or potassium and borate is one of the anions, in an amount sufficient to react with substantially all of the sulfur dioxide present in said gas;

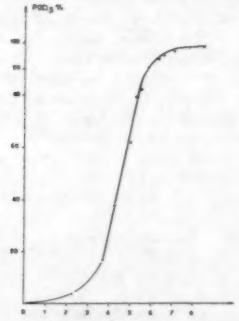
(b) venting the resultant waste gas and treating the resultant spent liquor with lime in an amount sufficient to regenerate the scrubbing liquor by precipitating insoluble calcium-sulfur containing salts and regenerating the borate ion; and

(c) separating the resultant, insoluble waste solids and recycling the sorbent liquor to step (a).

4,377,558
NOVEL POLYCHLOROPHOSPHAZENES AND PROCESS FOR THEIR PREPARATION

Roger De Jaeger, Chereng; Moncef Helioui, Villeneuve d'Ascq, and Emile Puskaric, Pont a Marcq, all of France, assignors to Institut Mondial du Phosphate, Casablanca, Morocco

Filed Sep. 15, 1980, Ser. No. 187,184
Claims priority, application France, Sep. 27, 1979, 79 24037
Int. Cl.³ C01B 25/10
U.S. Cl. 423—300 22 Claims

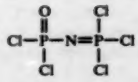


1. Linear polychlorophosphazenes, corresponding to the following formula I:

$$Cl_2(O)P\ (NPCl_2)_nCl \qquad I$$

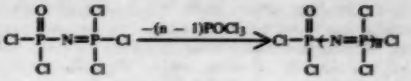
in which n is greater than 4, the value of n being controllable as desired to enable the production of chains of any desired medium length, said polychlorophosphazenes being substantially free of cyclic analogs and other impurities.

2. Process for the preparation of linear polychlorophosphazenes of the formula $Cl_2(O)P(NPCl_2)_nCl$, said process comprising polycondensation by heating of P trichloro-N dichlorophosphorylmonophosphazene of the following formula II:



II

in accordance with the following equation III:



III

with controlled release of $POCl_3$, to obtain quantitatively a practically pure polychlorophosphazene, of controlled degree of condensation, wherein $n \geq 4$.

4,377,559
NEW METHOD OF DISPOSING OF THE RESIDUE FROM THE PRODUCTION OF DIAKLYL PHOSPHOROCHLORIDOTHIONATE

Mark S. Carron, Spring Valley; Carl C. Greco, Garnerville; Lester P. VanBrocklin, Thiells, and Francis A. Via, Yorktown Heights, all of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 26, 1981, Ser. No. 296,109
Int. Cl.³ C01B 25/16
U.S. Cl. 423—317 7 Claims

1. A method of treating the residue from the production of phosphorochloridothionates comprising the steps of:

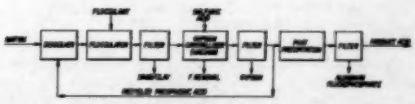
(a) contacting the residue with water and a chlorinating agent in an amount sufficient to form a chlorinated slurry wherein the amount of sulfur precipitated in the liquid phase is increased;

(b) hydrolyzing the chlorinated slurry in controllable amounts to produce decomposition gases having a decreased sulfur content, and other by-products comprising sulfur and phosphoric acid.

4,377,560
PROCESS FOR PRODUCING LOW ALUMINUM CONTENT PHOSPHORIC ACID FROM HIGH ALUMINUM MATRIX

Fernando Ore', Whittier, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Filed Jul. 13, 1981, Ser. No. 282,466
Int. Cl.³ C01B 25/16
U.S. Cl. 423—321 R 13 Claims



1. A process for retarding the precipitation of an aluminum fluorophosphate "$AlFHPO_4.2H_2O$" from impure aqueous phosphoric acid analyzing, in weight percent, no more than about 45% P_2O_5, above about 2% Al_2O_3 and above about 1% F, said process comprising reducing the content of F in said impure aqueous phosphoric acid in an amount sufficient to retard formation of a solid precipitate comprising an aluminum fluorophosphate "$AlFHPO_4.2H_2O$".

4,377,561
CLARIFICATION OF BLACK PHOSPHORIC ACID WITH PHOSPHORIC ACID RINSE WATER

Mark D. LaVanture, and George L. Walker, both of Richmond, Va., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 177,037, Aug. 11, 1980, abandoned. This application Jul. 30, 1981, Ser. No. 288,611
Int. Cl.³ C01B 25/16
U.S. Cl. 423—321 R 6 Claims

1. A process for clarifying black wet process phosphoric acid that comprises admixing said black phosphoric acid with phosphoric acid rinse water in a weight ratio of rinse water to

black phosphoric acid between about 0.5 and about 5 and letting the resultant mixture stand, thereby obtaining settled material and supernatant clarified black phosphoric acid, said phosphoric acid rinse water being the water collected from aluminum bright dipping water rinsing and containing, by weight, about 10–45% P_2O_5 and impurities including about 0.5–3% HNO_3 and about 0.2–3% Al.

4,377,562

SOLVENT EXTRACTION METHOD OF PHOSPHORIC ACID

Yoichi Hiraga, Shin-nanyo, and Osamu Watanabe, Tokuyama, both of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shin-nanyo, Japan

Filed Oct. 8, 1981, Ser. No. 309,774

Claims priority, application Japan, Nov. 29, 1980, 55-168681

Int. Cl.³ C01B *25/16*

U.S. Cl. 423—321 S **4 Claims**

1. A process for the solvent extraction of a crude phosphoric acid with an organic solvent which comprises counter-currently contacting an impure phosphoric acid solution containing at least 45 wt % of P_2O_5 with a partially water-miscible organic solvent in the presence of sulfuric acid and recovering a purified phosphoric acid wherein:

(a) as said organic solvent, a solvent in which from 3 to 10 wt % of water is soluble is used, and

(b) said sulfuric acid is added at a location wherein the H_3PO_4 concentration in the aqueous phase is at most 3 moles/liter in an amount so as to bring the relation between the free sulfuric acid concentration and the H_3PO_4 concentration in the aqueous phase at said location to satisfy the formula

$$5.0-0.83X \geqq Y \geqq 2.5-0.83X$$

within the range of the H_3PO_4 concentration in the aqueous phase being from 0.5 to 3 moles/liter.

4,377,563

METHOD OF PREPARING SILICON CARBIDE

Motoo Seimiya, Yokosukashi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 173,426, Jul. 29, 1980, abandoned. This application Mar. 15, 1982, Ser. No. 358,512

Int. Cl.³ C01B *31/36*

U.S. Cl. 423—345 **6 Claims**

1. A method of producing β-silicon carbide consisting essentially of heating a mixture consisting of wet process white carbon and a source of carbon in a hydrogen atmosphere to a temperature of 1200° C. to 1600° C., said wet process white carbon being produced by the process of dissociating an alkali metal silicate with an acid, and having a mean particle size between 0.015 and 0.035 micron and a surface area between 50 and 350 m^2/g.

4,377,564

METHOD OF PRODUCING SILICON

Reinhard Dahlberg, Flein, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 13, 1981, Ser. No. 253,557

Claims priority, application Fed. Rep. of Germany, May 2, 1980, 3016807

Int. Cl.³ C01B *33/02*

U.S. Cl. 423—349 **43 Claims**

1. A method for producing silicon comprising: providing a stream of gas; generating a plasma in said stream of gas; inserting a portion of a molded element containing silicon oxide into said plasma; reducing said silicon oxide to silicon in said plasma; and transporting the resulting silicon away in said stream of gas.

4,377,565

PROCESS FOR PRODUCING DIAMOND POWDER BY SHOCK COMPRESSION

Nobuo Setaka, Nagareyama, Japan, assignor to National Institute for Researches in Inorganic Materials, Ibaraki, Japan

Continuation of Ser. No. 163,947, Jun. 30, 1980, abandoned. This application Dec. 18, 1981, Ser. No. 332,204

Claims priority, application Japan, Aug. 10, 1979, 54-102541

Int. Cl.³ C01B *31/06;* B01J *3/08*

U.S. Cl. 423—446 **8 Claims**

1. In a process for producing a diamond powder by a shock compressing method, an improvement characterized by applying the shock compression to a carbon precursor obtained by heating at about 400° to 500° C. and thereafter pulverizing an organic compound which is not substantially melted by heating at 400° to 1000° C. and which is a thermosettable resin or cellulose, as a carbon source.

4,377,566

NOVEL PROCESS FOR THE PREPARATION OF HIGH PURITY ALUMINA FROM AMMONIUM ALUM

Roland Bachelard, Lyons, and Robert Barral, St. Symphorien D'Ozon, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Filed Jun. 29, 1981, Ser. No. 278,977

Claims priority, application France, Jul. 1, 1980, 80 14620

Int. Cl.³ C01F *7/32*

U.S. Cl. 423—631 **11 Claims**

1. A process for the preparation of alumina from ammonium alum comprising first dehydrating ammonium alum at a temperature above the fusion point of the alum and below the temperature which calcines the alum to alumina and then thermally decomposing the dehydrated alum with hot gas to produce alumina, the thermal decomposition being carried out with a flow of the hot gas forced through a layer of the dehydrated alum to heat and decompose the dehydrated alum and to continuously remove the decomposition products as they are formed, the movement of the dehydrated solid alum along with the gas flow being prevented.

4,377,567

LIPID MEMBRANE DRUG DELIVERY

Walter B. Geho, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 948,182, Oct. 2, 1978, abandoned. This application Sep. 13, 1979, Ser. No. 75,310

Int. Cl.³ A61K *43/00;* A01N *25/28;* A61K *9/62;* B01J *13/02*

U.S. Cl. 424—1 **40 Claims**

1. A composition of matter for internal administration in the therapeutic treatment of a human or animal comprising:

(A) a first component which is a drug or diagnostic agent, said first component being encapsulated in or associated with;

(B) a second component which comprises lipid membrane structures in the form of vesicles or liposomes, having an average particle diameter of between about 250 Angstroms and about 3000 Angstroms, which comprise a mixture of a major portion of a polar lipid and a minor portion of a digalactosyl derivative having at least one fatty substituent.

13. A composition according to claims **1**, **8**, **9** or **10** wherein said first component comprises a radionuclide.

4,377,568

PREPARATION OF AQUEOUS ALCOHOLIC DISPERSIONS OF PH SENSITIVE POLYMERS AND PLASTICIZING AGENTS AND A METHOD OF ENTERIC COATING DOSAGE FORMS USING SAME

Sham K. Chopra, Montreal, Canada, assignor to Merck Sharp & Dohme (I.A.) Corp., Kirkland, Canada

Filed Aug. 12, 1981, Ser. No. 292,111
Int. Cl.³ A61K *9/58, 9/56, 9/32, 9/30*
U.S. Cl. 424—31 10 Claims

1. An aqueous polymer dispersion for providing enteric coating on solid dosage forms which comprises

(a) an aqueous ethanolic solution as the dispersion medium

(b) a suspension of fine solid enteric coating particles, said particles comprising a plasticizing agent consisting of triethyl citrate, acetyl triethyl citrate, diethylphthalate, dibutyl phthalate, dibutyl sebacate, dibutyl tartrate, dibutyl maleate, dibutyl succinate or diethyl succinate and a pH sensitive pharmaceutically acceptable acid resistant polymer selected from the group consisting of cellulose acetate phthalate, polyvinyl acetate phthalate, and mixtures thereof wherein the particle size of the solid enteric coating particle is less than 1 micron in diameter, said plasticizing agent being present in an amount by weight of 10–40% of the weight of said acid resistant polymer.

4,377,569

METHOD OF TREATING ANIMALS TO RESIST INFECTIOUS DISEASES

Robert R. Plymate, Rte. 2, Oakland, Nebr. 68045

Continuation-in-part of Ser. No. 114,375, Jan. 21, 1980, abandoned. This application May 19, 1981, Ser. No. 265,327
Int. Cl.³ A61K *39/395*
U.S. Cl. 424—85 6 Claims

1. A method of treating an adult animal to successfully resist infectious diseases including orally administering to said animal a mixture of an animal feed and an additive at the rate of 1 to 2 pounds of additive per ton of animal feed: said additive produced by the process of

collecting bovine colostrum milk including antibodies particular to said infectious diseases,

removing substantially all of the fat from the colostrum milk,

removing the casein from the colostrum milk to obtain bovine colosteral whey,

dialyzing the whey,

adjusting the pH of the dialysate to 4.0–4.5,

precipitating the whey,

removing the supernatant from the precipitated whey,

clarifying the supernatant,

adding a water, saline and phenol mixture to the clarified supernatant to obtain the desired concentration,

sterilizing the mixture,

and drying the mixture.

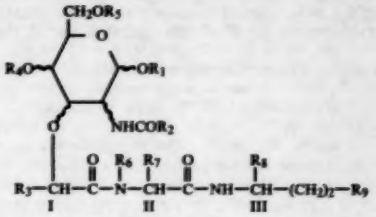
4,377,570

IMMUNOLOGICALLY ACTIVE DIPEPTIDYL SACCHARIDES AND METHODS OF PREPARATION

Philippe L. Durette, New Providence, and Tsung-Ying Shen, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 7,108, Jan. 29, 1979, Pat. No. 4,256,735. This application Oct. 3, 1980, Ser. No. 193,777
Int. Cl.³ A61K *39/00, 37/02*
U.S. Cl. 424—88 2 Claims

1. A composition comprising a vaccine for human or animal administration and an antibacterially effective amount of a 2-amino-2-deoxy-glycose compound of the general structural formula:



provided said glycose is not 2-amino-2-deoxy-D-glucose, wherein

R_1 is hydrogen, alkyl of 1 to 7 carbon atoms optionally substituted by hydroxy, mercapto, alkoxy of 1 to 3 carbon atoms, alkyl mercapto of 1 to 3 carbon atoms, hydroxy or mercapto esterified by an acid of 1 to 4 carbon atoms, halogen, carboxyl, carboxyl esterified by an alcohol of 1 to 3 carbon atoms, or amidated carboxyl,

phenyl, benzyl, each optionally substituted by alkyl of 1 to 3 carbon atoms, lower alkyldioxy, amino, trifluoromethyl, hydroxy, mercapto, hydroxy or mercapto etherified by alkyl of 1 to 3 carbon atoms, or hydroxy or mercapto esterified by an acid of 1 to 4 carbon atoms;

R_2 is alkyl of 1 to 7 carbon atoms optionally substituted by hydroxy, mercapto, alkoxy of 1 to 3 carbon atoms, alkyl mercapto of 1 to 3 carbon atoms, hydroxy or mercapto esterified by an acid of 1 to 4 carbon atoms, halogen, carboxyl, carboxyl esterified by an alcohol of 1 to 3 carbon atoms, or amidated carboxyl,

phenyl, optionally substituted by alkyl of 1 to 3 carbon atoms, lower alkyldioxy, amino, trifluoromethyl, hydroxy, mercapto, hydroxy or mercapto etherified by alkyl of 1 to 3 carbon atoms, or hydroxy or mercapto esterified by an acid of 1 to 4 carbon atoms;

R_3 is H or alkyl of 1 to 10 carbon atoms;

R_4 and R_5 are same or different and are

hydrogen, alkanoyl of 2 to 21 carbon atoms,

benzoyl, naphthoyl-1 or naphthoyl-2 each optionally substituted by halogen, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 3 carbon atoms, trifluoromethyl, hydroxy or alkanoyloxy of 1 to 3 carbons,

an alkanesulfonic acid of 1 to 7 carbon atoms, or a phenylsulfonic acid optionally substituted by alkyl of 1 to 3 carbon atoms,

carbamoyl, alkyl carbamoyl of 1 to 3 carbon atoms, phenylcarbamoyl or napththylcarbamoyl;

R_6 is H or R_6–R_7 together is $—CH_2—CH_2—CH_2—$;

R_7 is H, alkyl of 1 to 7 carbon atoms, hydroxymethyl, mercaptomethyl, benzyl; or substituted benzyl wherein the substituents are the same as defined for R_1;

R_8 and R_9 each is carboxyl, esterified carboxyl of 1 to 7 carbon atoms, amidated carboxyl, or mono- or dialkyl amidated carboxyl wherein the alkyl group has 1 to 3 carbon atoms;

provided that when R_3 is lower alkyl, the stereochemistry at asymmetric center I can be either D or L, when R_7 is not H, the stereochemistry at asymmetric center II is either L or D, and the stereochemistry at asymmetric center III is D.

2. A composition comprising a vaccine for human or animal administration and an amount of a 2-amino-2-deoxy-glycose compound according to claim 1 wherein the compound is present in an amount effective to exert an adjuvant effect.

4,377,571

METHODS FOR TREATING DUTCH ELM DISEASE

Gary A. Strobel, Bozeman, Mont., assignor to Research and Development Institute, Inc. at Montana State University, Bozeman, Mont.

Continuation-in-part of Ser. No. 95,448, Nov. 19, 1979, Pat. No. 4,277,462, and a continuation-in-part of Ser. No. 205,862, Nov. 10, 1980, Pat. No. 4,342,746. This application Apr. 24, 1981, Ser. No. 257,424

The portion of the term of this patent subsequent to Jul. 7, 1998, has been disclaimed.

Int. Cl.³ A01N 63/00, 63/02

U.S. Cl. 424—93 16 Claims

1. A method for treating Dutch elm disease comprising applying a microorganism comprising a strain of *P. syringae* to an elm tree in a Dutch elm disease-controlling amount; said strain of *P. syringae* being at least as active against Dutch elm disease as *P. syringae* NRRL B-12050; said microorganism being applied early in the growing season when the sap is active, and wherein the microorganism is applied to an elm tree having no more than about 10% of its crown showing disease symptoms.

4,377,572

TISSUE ADHESIVE

Otto Schwarz; Yendra Linnau; Franz Löblich, and Thomas Seelich, all of Vienna, Austria, assignors to Immuno Aktiengesellschaft für Chemisch-Medizinische Produkte, Vienna, Austria

Continuation-in-part of Ser. No. 118,656, Feb. 4, 1980, Pat. No. 4,298,598. This application Jul. 7, 1981, Ser. No. 283,657

Claims priority, application Austria, Feb. 15, 1979, 1190/79

The portion of the term of this patent subsequent to Nov. 3, 1998, has been disclaimed.

Int. Cl.³ A61K 35/14, 37/00

U.S. Cl. 424—101 12 Claims

1. A tissue adhesive comprising plasma proteins of human or animal origin, which plasma proteins contain: factor XIII in an amount of at least 7 units/ml, fibrinogen in an amount of at least 70 mg/ml, the ratio of factor XIII to fibrinogen, expressed in units of factor XIII per gram of fibrinogen, amounting to at least 100; cold-insoluble globulin and albumin, the ratio of fibrinogen to cold-insoluble globulin to albumin being 60 to 98:0.5 to 20:0 to 15; plasminogen-activator inhibitor or plasmin inhibitor in an amount of 20 to 2,000 KIU per ml, wherein the tissue adhesive as determined according to the SDS-polyacrylamide-gel-electrophoresis method is capable of complete cross-linking of the fibrin-γ-chains after 3 to 5 minutes of incubation and of at least 35% cross-linking of the fibrin-α-chains after two hours of incubation.

4,377,573

METHOD OF CONTROL OF GASTROINTESTINAL BLEEDING

Harry H. LeVeen, 321 Confederate Cir., Charleston, S.C. 29407

Continuation of Ser. No. 670,969, Mar. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 259,279, Jun. 2, 1972, abandoned. This application Jan. 6, 1978, Ser. No. 867,501

Int. Cl.³ A61K 37/00, 31/135

U.S. Cl. 424—177 4 Claims

1. A method for the treatment and control of gastrointestinal bleeding and secretion of hydrochloric acid which comprises injecting intraperitoneally a single dose of from 2 to 10 milligrams of a vasoconstrictor compound selected from the group consisting of norepinephrin, vasopressin and angiotensin dissolved in a pharmaceutically acceptable liquid carrier.

4,377,574

CONTRACEPTIVE TREATMENT OF MALE MAMMALS

Catherine L. Rivier; Jean E. F. Rivier, and Wylie W. Vale, Jr., all of La Jolla, Calif., assignors to The Salk Institute For Biological Studies, San Diego, Calif.

Continuation-in-part of PCT No. PCT/US80/00818, Jun. 26, 1980, published as WO 82/00004 on Jan. 7, 1982, abandoned.

Filed Jun. 12, 1981, Ser. No. 272,968

Int. Cl.³ A61K 37/00; C07C 103/52

U.S. Cl. 424—177 9 Claims

1. A method for inhibiting spermatogenesis in male mammals and thereby preventing reproduction comprising administering an effective amount of a peptide or a nontoxic salt thereof to a male mammal, at a daily dosage level of not more than about 3 milligrams per kilogram of body weight, said peptide being an LRF antagonist having an ICR_{50} of less than 1/1.

4,377,575

CORTICOID-17-(ALKYL CARBONATES) AND PROCESS FOR THEIR MANUFACTURE

Ulrich Stache, Hofheim am Taunus; Werner Fritsch, Bad Soden am Taunus; Hans G. Alpermann, and Jürgen K. Sandow, both of Königstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

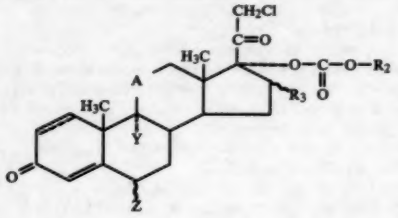
Continuation of Ser. No. 31,845, Apr. 20, 1979, abandoned. This application Dec. 15, 1980, Ser. No. 216,258

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1978, 2817988

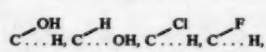
Int. Cl.³ A61K 31/56; C07J 5/00

U.S. Cl. 424—243 13 Claims

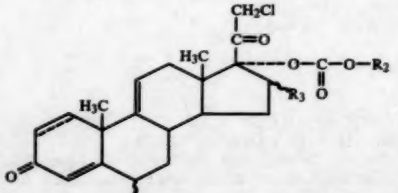
1. A corticoid-21-chloro-17-(alkyl carbonate) selected from the group consisting of compounds of the formula



wherein A is



or C=O, and compounds of the formula



wherein

Y is hydrogen, fluorine, or chlorine;

Z is hydrogen, chlorine, fluorine, or methyl;

R_3 is hydrogen, α-methyl, or β-methyl; and

R_2 is alkyl having 1 to 10 carbon atoms.

12. A pharmaceutical composition for the treatment of inflammatory dermatosis which comprises an effective amount

of a compound as in claim 1 and a pharmaceutically-acceptable carrier therefor.

4,377,576

5-(HETEROCYCLIC AMINO-PROPIONYL)-5,10-DIHYDRO-11H-DIBENZO[B-,E][1,4]DIAZEPIN-11-ONES

Günther Schmidt, Biberach, Fed. Rep. of Germany, and Mario Bergamaschi, Monza, Italy, assignors to Karl Thomae Gesellschaft mit beschränkter Haftung, Biberach an der Riss, Fed. Rep. of Germany

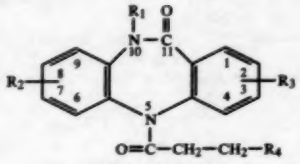
Filed Jul. 13, 1981, Ser. No. 282,501

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1980, 3028001

Int. Cl.³ A61K *31/55*; C07D *243/38*

U.S. Cl. 424—244 **7 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen, methyl or ethyl;

R_2 is hydrogen or chlorine;

R_3 is hydrogen or chlorine; and

R_4 is pyrrolidino, piperidino, 2-methyl-piperidino, 2-ethyl-piperidino, 2,6-dimethyl-piperidino or morpholino;

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

7. The method of inhibiting the secretion of gastric fluid or the formation of stomach ulcers in a warm-blooded animal in need thereof, which comprises perorally, parenterally or rectally administering to said animal an effective secretion-inhibiting or anti-ulcerogenic amount of a compound of claim 1.

4,377,577

USE OF PSYCHOACTIVE DRUGS IN UTERUS TO PREVENT PREGNANCY

Milton J. Cormier, Bogart, Ga., assignor to University of Georgia Research Foundation, Inc., Athens, Ga.

Continuation-in-part of Ser. No. 155,800, May 30, 1980. This application Jul. 6, 1981, Ser. No. 253,567

Int. Cl.³ A61K *31/38, 31/54, 31/495*

U.S. Cl. 424—247 **8 Claims**

1. The method of preventing pregnancy which comprises introducing an effective amount of a psychoactive drug directly into the uterus of the female.

4,377,578

PIPERAZINE DERIVATIVES

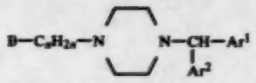
Jan Vandenberk, Beerse; Ludo E. J. Kennis, Vosselaar; Marcel J. M. C. Van der Aa, Vosselaar, and Albert H. M. Th. Van Heertum, Vosselaar, all of Belgium, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium

Continuation of Ser. No. 88,703, Oct. 26, 1979, abandoned, which is a division of Ser. No. 875,342, Feb. 6, 1978, Pat. No. 4,200,641, which is a continuation of Ser. No. 753,062, Dec. 21, 1976, abandoned, which is a continuation-in-part of Ser. No. 672,919, Apr. 2, 1976, abandoned. This application Jul. 24, 1981, Ser. No. 286,438

Int. Cl.³ A61K *31/495*; C07D *403/06*

U.S. Cl. 424—250 **6 Claims**

1. A chemical compound selected from the group consisting of a compound having the formula



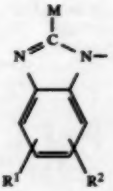
and the pharmaceutically acceptable acid addition salts thereof, wherein:

Ar^1 and Ar^2 are each independently selected from the group consisting of phenyl, substituted phenyl and pyridinyl, wherein said substituted phenyl is phenyl having from 1 to 2 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, trifluoromethyl and nitro;

n is an integer of from 2 to 6 inclusive, provided that when C_nH_{2n} represents a branched alkylene chain, then at least 2 carbon atoms are present in the linear portion of the chain linking

B with the piperazine nitrogen atom; and

B is a radical having the formula

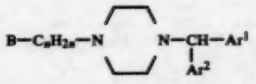


wherein:

R^1 and R^2 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl; and

M is a member selected from the group consisting of phenyl, phenylmethyl, mercapto, lower alkylthio, amino, lower alkylcarbonylamino, lower alkyloxycarbonylamino, and cycloalkyl having from 3 to 6 carbon atoms.

2. A pharmaceutical composition comprising an inert carrier material and as an active ingredient an effective antihistaminic or anti-anaphylactic amount of a chemical compound selected from the group consisting of a compound having the formula

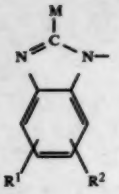


and the pharmaceutically acceptable acid addition salts thereof, wherein:

Ar^1 and Ar^2 are each independently selected from the group consisting of phenyl, subtituted phenyl and pyridinyl, wherein said substituted phenyl is phenyl having from 1 to 2 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, trifluoromethyl and nitro;

n is an integer of from 2 to 6 inclusive, provided that when C_nH_{2n} represents a branched alkylene chain, then at least 2 carbon atoms are present in the linear portion of the chain linking B with the piperazine nitrogen atom; and

B is a radical having the formula



wherein:

R^1 and R^2 are each independently selected from the group consisting of hydrogen, halo, lower alkyl, and trifluoromethyl; and

M is a member selected from the group consisting of phenyl, phenylmethyl, mercapto, lower alkylthio, amino, lower alkylcarbonylamino, lower alkyloxycarbonylamino, and cycloalkyl having from 3 to 6 carbon atoms.

4,377,579

N-(TETRAZOL-5-YL)PHENAZINE-1-CARBOXAMIDES

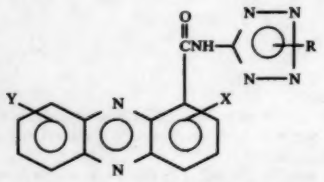
Edward H. Erickson, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 3, 1981, Ser. No. 326,853

Int. Cl.³ A61K *31/495;* **C07D** *241/46*

U.S. Cl. 424—250 **13 Claims**

1. Compounds of the formula:



wherein R is a hydrogen atom or a C_1–C_4 alkyl group, X is a hydrogen atom, halogen atom, or a methoxy or methyl group, and Y is a hydrogen atom, halogen atom, or a methoxy or ethoxy group.

4,377,580

TRICYCLIC QUINAZOLINE DERIVATIVES

Ikuo Ueda, Toyonaka; Masayuki Kato, Minoo, and Masanobu Nagano, Ikeda, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

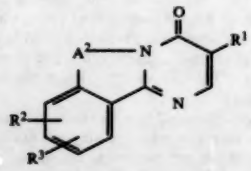
Filed Nov. 25, 1980, Ser. No. 210,340

Claims priority, application United Kingdom, Dec. 3, 1979, 7941607; Oct. 3, 1980, 8031965

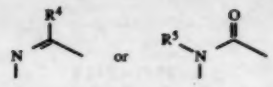
Int. Cl.³ A61K *31/505;* **C07D** *487/04, 239/80, 471/14*

U.S. Cl. 424—251 **10 Claims**

1. A pyrimidoquinazoline compound of the formula:



wherein A^2 is a group of the formula:



R^1 is hydrogen, carboxy or C_2–C_7 alkoxycarbonyl,

R^2 and R^3 are hydrogen, C_1–C_6 alkyl, halogen, nitro amino, C_1–C_6 alkoxy, phenyloxy, C_1–C_6 alkylthio, C_1–C_6 alkylpiperazinyl, C_1–C_{18} alkanoylamino, di(C_1–C_6)alkanoylamino, C_3–C_9 alkoxalylamino, C_4–C_8 cycloalkanecarbonylamino, C_3–C_7 cycloalkyl(C_1–C_6)alkanoylamino, benzamido, phenyl(C_1–C_6)alkanoylamino, C_1–C_6 alkanesulfonylamino or di(C_1–C_6)alkylamino which may be substituted with hydroxy,

R^4 is hydrogen, C_1–C_6 alkyl, hydroxy, C_1–C_6 alkoxy, C_2–C_6 alkenyloxy or di(C_1–C_6)alkylamino, and

R^5 is C_1–C_6 alkyl or C_2–C_6 alkenyl, or pharmaceutically acceptable salt thereof.

10. An anti-allergic pharmaceutical composition comprising a effective amount of the compound of claim 1 in association with a non-toxic, pharmaceutically acceptable carrier or excipient.

4,377,581

CHLORO- AND ALKOXY-SUBSTITUTED-2,4-DIAMINOQUINAZOLINES

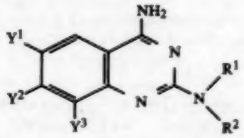
Hans-Jurgen E. Hess, Old Lyme; Jasjit S. Bindra, and Praful K. Shah, both of Groton, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 126,838, Mar. 3, 1980, Pat. No. 4,287,341, which is a continuation-in-part of Ser. No. 90,313, Nov. 1, 1979, abandoned. This application Apr. 10, 1981, Ser. No. 253,052

Int. Cl.³ A61K *31/505;* **C07D** *239/95, 403/04*

U.S. Cl. 424—251 **17 Claims**

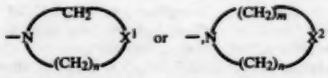
1. A compound of the formula



wherein Y^1 is chloro, Y^2 is OR and Y^3 is hydrogen or OR and the pharmaceutically acceptable acid addition salts thereof;

R is alkyl having from one to three carbon atoms;

R^1 and R^2 are the same or different and when taken separately are each a member selected from the group consisting of hydrogen, alkyl having from 1 to 5 carbon atoms, cycloalkyl having from 3 to 8 carbon atoms; alkenyl having from 3 to 5 carbon atoms, alkynyl having from 3 to 5 carbon atoms, hydroxy substituted alkyl having from 2 to 5 carbon atoms and when taken together with the nitrogen atom to which they are attached R^1 and R^2 form



where X^1 is a member selected from the group consisting of $S(O)_t$, $CHOR^6$, $-(CH_2)_p-$ and CHR^7, and X^2 is a member selected from the group consisting of X^1, O, NR^3, $NCOR^4$ and $NCOOR^5$, where

m is 2 or 3,

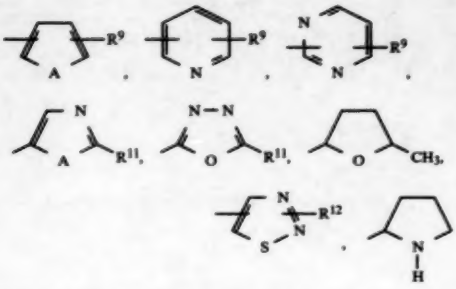
n is 2 or 3,

p is 1 to 3,

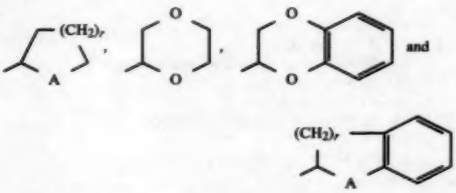
t is 0, 1 or 2;

R^3 is a member selected from the group consisting of hydrogen, alkyl having from 1 to 6 carbon atoms, alkenyl from 3 to 5 carbon atoms, alkynyl having from 3 to 5 carbon atoms, hydroxy substituted alkyl having from 2 to 5 carbon atoms, cycloalkyl having from 3 to 8 carbon atoms, $-(CH_2)_qC_6H_4R_8$ and $-(CH_2)_qC_{10}H_6R^8$, where q is 0 or 1;

R^4 is a member selected from the group consisting of hydrogen, alkyl having from 1 to 6 carbon atoms, alkenyl having from 3 to 5 carbon atoms, cycloalkyl and cycloalkylmethyl wherein said cycloalkyl has from 3 to 8 carbon atoms,



R^{10}, CH_2R^{10} and $(CH_2)_qC_6H_4R^8$ where A is S or O, q is as defined above and R^{10} is a member selected from the group consisting of



where r is 1 or 2;

R^5 is a member selected from the group consisting of alkyl having from 1 to 7 carbon atoms, alkenyl having 3 to 5 carbon atoms, cycloalkyl having from 3 to 8 carbon atoms, hydroxy substituted alkyl having from 2 to 5 carbon atoms, $CH_2C_6H_4R^8$, $CH_2C_{10}H_6R^8$, CH_2R^{10} and CH_2O-pyridyl;

R^6 is a member selected from the group consisting of hydrogen, $C_6H_4R^8$, $-(CH_2)_pZ\ R^{15}$, alkyl having from 1 to 6 carbon atoms and said alkyl substituted by a member selected from the group consisting of Cl, F, Br, OH, CH_3O, SO_2CH_3 and $NHSO_2CH_3$, where p and A are as previously defined and Z is a member selected from the group consisting of O, S, SO, SO_2, and NR^{16};

R^7 is a member selected from the group consisting of alkyl having from one to six carbon atoms, hydroxyalkyl having from one to five carbon atoms, $-(CH_2)_qC_6H_4R^8$ and $COC_6H_4R^8$;

R^8 is a member selected from the group consisting of H, Cl, Br, F, CH_3, CH_3O, CF_3, OH, SO_2CH_3 and $NHSO_2CH_3$;

R^9 is a member selected from the group consisting of H, Cl, CH_3, C_2H_5 and phenyl;

R^{11} is hydrogen or methylthio and

R^{12} is a member selected from the group consisting of H, NH_2 alkyl having from one to four carbon atoms and $NHCO_2R^{14}$;

R^{14} is alkyl having from one to four carbon atoms;

R^{15} is a member selected from the group consisting of alkyl having from one to four carbon atoms, $C_6H_4R^8$ and $C_{10}H_6R^8$; and R^{16} is hydrogen or alkyl having from one to four carbon atoms.

12. A pharmaceutical composition for oral or parenteral administration to a mammal comprising a pharmaceutically acceptable carrier and an antihypertensive effective amount of a compound according to claim 1.

4,377,582

2-PHENYL-4-[CIS-2,5-DIMETHYL-4-(2-PYRIDINYL)-1-PIPERAZINYL]QUINAZOLINE

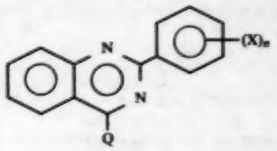
Ying-Ho Chen, Richmond, Va., assignor to A. H. Robins Company, Inc., Richmond, Va.

Division of Ser. No. 105,161, Dec. 19, 1979, Pat. No. 4,306,065. This application May 22, 1981, Ser. No. 266,257

Int. Cl.³ A61K 31/505

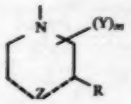
U.S. Cl. 424—251 14 Claims

1. The method of treating hypertension in warm blooded animals which comprises administering to said animal an effective amount of a compound having the formula:



wherein

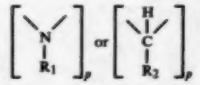
Q is



or $-NR_3R_4$

R is selected from hydrogen, hydroxy, loweralkoxy, loweralkanolyl, phenoxy or phenoxy substituted by loweralkyl, loweralkoxy, trifluoromethyl, amino, nitro or halo;

Z is selected from



and

p is zero to one inclusive;

R_1 is selected from loweralkyl, loweralkanolyl, 2-pyridyl, loweralkenyloxy-loweralkanolyl, loweralkynyloxyloweralkanolyl, loweralkanyloxy-loweralkanolyl, phenoxyloweralkanolyl and phenoxy-loweralkanolyl having phenoxy substituted by loweralkoxy, loweralkyl, nitro, amino, trifluoromethyl and halo;

R_2 is selected from hydrogen, hydroxy, loweralkyl, loweralkoxy, phenoxy or naphthoxy;

R_3 is selected from loweralkanolyl, 4-cyanocyclohexyloweralkyl, phenoxy-loweralkanolyl or phenoxy-loweralkanolyl having phenoxy substituted by loweralkoxy, loweralkyl, nitro, amino, trifluoromethyl or halo;

R_4 is selected from hydrogen or loweralkyl;

X is selected from hydrogen, loweralkyl, loweralkoxy, nitro, amino or halo and n is one to three;

Y is loweralkyl and m is 0 to 2 inclusive and the pharmaceutically acceptable addition salts and hydrates thereof.

9. A pharmaceutical composition for treating hypertension in warm-blooded animals for the purpose of lowering blood pressure comprising (a) an effective amount of a compound selected from the group consisting of 4-(4-hexyl-1-piperazinyl)-2-phenylquinazoline, 1-(2-phenyl-4-quinazolinyl)-3-piperidinemethanol, 4-[3-(2-methoxyphenoxyl-1-pyrrolidinyl]-2-phenylquinazoline, 2-phenyl-4-[4-(2-pyridinyl)-1-piperazinyl]quinazoline and 4-(2-phenyl-4-quinazolinyl-α-[(2-propenyloxy)methyl]-1-piperazineethanol and (b) a pharmaceutically acceptable carrier therefor.

4,377,583

N-METHYL-D-GLUCAMINE SALT OF WITH 3,4-DIHYDRO-5-METHYL-6-(2-METHYLPROPYL)-4-OXOTHIENO[2,3-D]PYRIMIDINE-2-CARBOXYLIC ACID

Aubrey A. Larsen, and Donald A. Owens, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed Aug. 21, 1981, Ser. No. 294,962
Int. Cl.³ C07D 513/04; A61K 31/505
U.S. Cl. 424—251 **4 Claims**

1. The N-methyl-D-glucamine salt of 3,4-dihydro-5-methyl-6-(2-methylpropyl)-4-oxothienyl[2,3-d]pyrimidine-2-carboxylic acid.

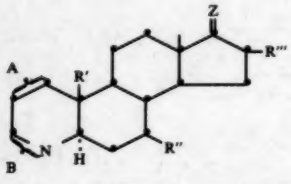
4,377,584

4-AZA-17β-SUBSTITUTED-5α-ANDROSTAN-3-ONE-REDUCTASE INHIBITORS

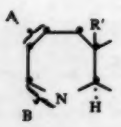
Gary H. Rasmusson, Watchung; David B. R. Johnston, Warren, both of N.J., and Glen E. Arth, deceased, late of Cranford, N.J. (by Rose B. Arth, executrix), assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 20,371, Mar. 15, 1979, abandoned, which is a continuation-in-part of Ser. No. 896,118, Apr. 13, 1978, abandoned. This application Sep. 23, 1980, Ser. No. 189,981
Int. Cl.³ A61K 31/395, 31/47; C07D 221/18
U.S. Cl. 424—258 **19 Claims**

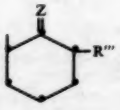
1. A compound of the formula:



(I)



(II)



(III)

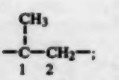
where Formula (I) may also have the structure of partial Formulas (II) and/or (III); wherein,

A is

(1) —CH_2—CH_2—;

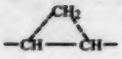
(2) —CH=CH—;

(3)



or

(4)



B is

(1)

where

R^1 is,

(a) hydrogen;

(b) methyl or ethyl;

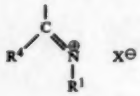
(c) ethenyl;

(d) ethynyl;

(e) NR^2R^3 where R^2 and R^3 are hydrogen or methyl; or

(f) cyano; or

(2)



where $X^{\ominus}$ is any anion and R^4 is,

(a) OR^5 where R^5 is C_{1-4}alkyl; or

(b) NR^6R^7, where R^6 and R^7 are hydrogen or methyl;

R′ is hydrogen or methyl;

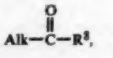
R″ is hydrogen or β-methyl;

R‴ is hydrogen, β-methyl or hydroxyl;

Z is

(1) α-hydrogen or α-hydroxyl and

(a)



where AlK is present or absent and is straight or branched hydrocarbon chain of 1 to 12 carbon atoms; and R^8 is,

(i) hydrogen,

(ii) hydroxyl,

(iii) C_{1-4}alkyl

(iv) NR^9R^{10}, where R^9 and R^{10} are each independently selected from hydrogen, C_{1-8} straight or branched chain alkyl, C_{3-6} cycloalkyl, phenyl; or R^9 and R^{10} taken together with the nitrogen to which they are attached represent a 5-6 membered saturated ring comprising up to one other heteroatom selected from oxygen and nitrogen; or

(v) OR^{11}, where R^{11} is M, where M is hydrogen or alkali metal, or C_{1-18} straight or branched chain alkyl; benzyl; or

(b) Alk-OR^{12}, where Alk is always present and has the same meaning as above, and R^{12} is

(i) phenyl C_{1-6} alkylcarbonyl,

(ii) C_{5-10} cycloalkylcarbonyl,

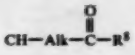
(iii) benzoyl, or

(iv) C_{1-8} alkoxycarbonyl;

(v) amino, or C_{1-8} alkyl substituted amino, carbonyl; or

(vi) hydrogen, provided that Alk is a branched C_3–C_8 chain;

(2)

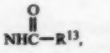


or CH-Alk-OR[12], where Alk is present or absent and has the same meaning as above, and R^8 and R^{12} have the same meaning as above, and R^{12} is also hydrogen or C_{1-20} alkylcarbonyl;

(3)

where the dashed bond replaces the 17α hydrogen;

(4) α-hydrogen and



where R^{13} is,

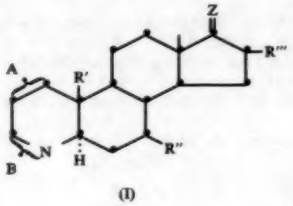
(a) C_{1-12} alkyl; or

(b) NR^9R^{10};

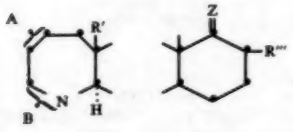
(5) α-hydrogen and cyano; or

(6) α-hydrogen and tetrazolyl; and pharmaceutically acceptable salts of the above compounds.

18. A pharmaceutical composition comprising a pharmaceutically acceptable carrier and a compound of formula:



(I)



(II) (III)

where Formula (I) may also have the structure of partial Formulas (II) and/or (III);

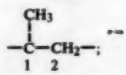
wherein,

A is

(1) $-CH_2-CH_2-$;

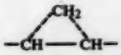
(2) $-CH=CH-$;

(3)



or

(4)



B is

(1)

where

R^1 is,

(a) hydrogen;

(b) methyl or ethyl;

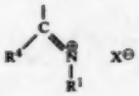
(c) ethenyl;

(d) ethynyl;

(e) NR^2R^3 where R^2 and R^3 are hydrogen or methyl; or

(f) cyano; or

(2)



where $X^{\ominus}$ is any anion and R^4 is,

(a) OR^5 where R^5 is C_{1-4}alkyl; or

(b) NR^6R^7, where R^6 and R^7 are hydrogen or methyl;

R′ is hydrogen or methyl;

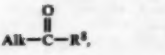
R″ is hydrogen or β-methyl;

R‴ is hydrogen, β-methyl or hydroxyl;

Z is

(1) α-hydrogen or α-hydroxyl and

(a)



where Alk is present or absent and is straight or branched hydrocarbon chain of 1 to 12 carbon atoms; and R^8 is,

(i) hydrogen,

(ii) hydroxyl,

(iii) C_{1-4}alkyl

(iv) NR^9R^{10}, where R^9 and R^{10} are each independently selected from hydrogen, C_{1-4} straight or branched chain alkyl, C_{3-6} cycloalkyl, phenyl; or R^9 and R^{10} taken together with the nitrogen to which they are attached represent a 5-6 membered saturated ring comprising up to one other heteroatom selected from oxygen and nitrogen; or

(v) OR^{11}, where R^{11} is M, where M is hydrogen or alkali metal, or C_{1-18} straight or branched chain alkyl; benzyl; or

(b) Alk-OR^{12}, where Alk is always present and has the same meaning as above, and

R^{12} is

(i) phenyl C_{1-6} alkylcarbonyl,

(ii) C_{5-10} cycloalkylcarbonyl,

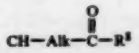
(iii) benzoyl, or

(iv) C_{1-8} alkoxycarbonyl;

(v) amino, or C_{1-8} alkyl substituted amino, carbonyl; or

(vi) hydrogen, provided that Alk is a branched C_3–C_8 chain;

(2)



or CH-Alk-OR^{12}, where Alk is present or absent and

has the same meaning as above, and R^8 and R^{12} have the same meaning as above, and R^{12} is also hydrogen or C_{1-20} alkylcarbonyl;

(3)

where the dashed bond replaces the 17α hydrogen;

(4) α-hydrogen and

where R^{13} is,

(a) C_{1-12} alkyl; or

(b) NR^9R^{10}; or

(5) α-hydrogen and cyano; or

(6) α-hydrogen and tetrazolyl; and pharmaceutically acceptable salts of the above compounds.

4,377,585

USE OF 4-[4(OR 3)-AMINOPHENYL]PYRIDINES AS CARDIOTONIC AGENTS

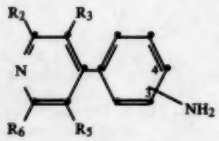
George Y. Lesher, Schodack, and Donald F. Page, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 152,991, May 27, 1980, Pat. No. 4,317,827. This application Jul. 20, 1981, Ser. No. 284,771

Int. Cl.³ A61K *31/44*

U.S. Cl. 424—263 **3 Claims**

1. The method for increasing cardiac contractility in a patient requiring such treatment which comprises administering orally or parenterally in a solid or liquid dosage form to such patient an effective amount of a cardiotonic 4-[4(or 3)-aminophenyl]-2-R_2-3-R_3-5-R_5-6-R_6-pyridine having the formula



where R_2 is hydrogen, methyl, ethyl or hydroxyl, R_6 is hydrogen, methyl or ethyl, R_3 and R_5 are each hydrogen or methyl, or pharmaceutically-acceptable acid-addition salt thereof.

4,377,586

DIURETIC 2,6-DIARYL-4-PYRIDINE CARBOXYLIC ACIDS

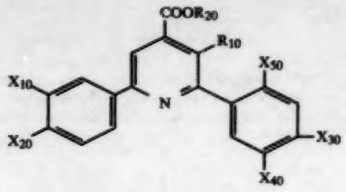
Louis L. Skaletzky, Parchment, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 30, 1981, Ser. No. 259,135

Int. Cl.³ A61K *31/44*; C07D *213/55*

U.S. Cl. 424—266 **3 Claims**

1. A method for inducing diuresis in a human in need of such treatment which comprises systemically adminstering to said human an amount effective to cause diuresis of a compound of the Formula II,



II

wherein

(1) R_{10} is hydrogen or methyl;

(2) R_{20} is hydrogen or a pharmacologically acceptable cation;

(3) X_{10} is hydrogen or trifluoromethyl;

(4) X_{20} is hydrogen, chloro, fluoro, bromo, iodo, or trifluoromethyl;

(5) X_{30} is hydrogen, methyl, chloro, bromo, iodo, trifluoromethyl, or $—CH_2—R_{50}$, wherein R_{50} is (C_2–C_7) alkyl;

(6) X_{40} is hydrogen, chloro, fluoro, trifluoromethyl, or methyl; and

(7) X_{50} is hydrogen, (C_1–C_4) alkoxy or acetoxy;

with the following provisos:

(a) at least one of X_{10} and X_{20} and at least one of X_{30} and X_{40} is other than hydrogen;

(b) X_{10} is trifluoromethyl only when X_{20} is hydrogen, X_{30} is hydrogen, and X_{40} is trifluoromethyl;

(c) X_{40} is chloro only when X_{30} is chloro;

(d) one of X_{30} and X_{40} is methyl only when the other is methyl;

(e) X_{50} is (C_1–C_4) alkoxy or acetoxy only when X_{10} and X_{40} are hydrogen, X_{20} is chloro, bromo, iodo, or trifluoromethyl, and X_{30} is chloro, bromo, iodo, trifluoromethyl, or $CH_2—R_{50}$;

(f) X_{20} is fluoro only when R_{10} is methyl and X_{30} is chloro; and

(g) X_{40} is fluoro only when X_{30} is phenyl.

4,377,587

ARYLAMINE DERIVATIVES AND USE THEREOF AS MICROBICIDES

Adolf Hubele, Magden, Switzerland; Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany, and Peter Riebli, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

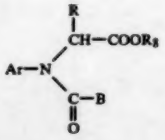
Filed Jul. 21, 1981, Ser. No. 285,652

Claims priority, application Switzerland, Jul. 25, 1980, 5709/80; Jul. 25, 1980, 5710/80

Int. Cl.³ A01N *37/22*; C07C *103/32*

U.S. Cl. 424—269 **34 Claims**

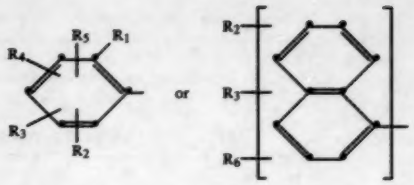
1. A compound of the formula



wherein

R is hydrogen or methyl,

Ar is one of the aromatic groups



wherein

R_1 is C_1–C_3alkyl, C_1C_3alkoxy or halogen,

R_2 is NO_2 or NH_2,

R_3 is hydrogen, C_1–C_3alkyl, C_1–C_3alkoxy or halogen,

R_4 is hydrogen or C_1–C_3alkyl,

R_5 is hydrogen or C_1–C_3alkyl, and

R_6 is hydrogen, C_1–C_3alkyl or halogen;

R_8 is C_1–C_3alkyl,

B is C_3–C_4alkyl, C_2–C_4alkenyl, cyclopropyl, 2-furyl, 2-tetrahydrofuryl, β-(C_1–C_2alkoxy)ethyl or the group CH_2Z, in which

Z is 1H-1,2,4-triazolyl, methylsulfonyl, X–R_{13}, OSO_2–R_{14} or –$N_{(15)}(R_{16})$, in which

X is oxygen or sulfur,

R_{13} is an alkyl, alkenyl or alkynyl group, each containing at most 4 carbon atoms.

R_{14} is C_1–C_3alkyl or NH(C_1–C_3alkyl), and

R_{15} and R_{16}, each independently of the other, are C_1–C_3alkyl.

19. A method of controlling and/or protecting plants from attack by phytopathogenic microorganisms, which method comprises applying to said plants or to the locus thereof a microbicidally effective amount of a compound according to claim **1**.

4,377,588

4-(SUBSTITUTED THIAZOLYL)-3-HYDROXY-3-PYRROLINE-2,5-DIONE INHIBITORS OF GLYCOLIC ACID OXIDASE

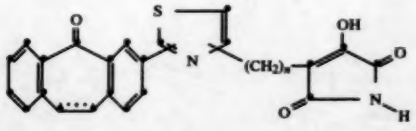
Edward J. Cragoe, Jr., Lansdale; Clarence S. Rooney, Worcester, both of Pa., and Haydn W. R. Williams, Dollard des Ormeaux, Canada, assignors to Merck Sharp & Dohme (I.A.) Corp. and Merck & Co., Inc., both of Rahway, N.J.

Filed Sep. 11, 1979, Ser. No. 74,468

Int. Cl.³ A61K *31/425*; C07D *417/04*

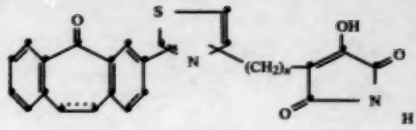
U.S. Cl. 424—270 **7 Claims**

1. The compounds having the structure:



wherein n is 0 to 2, the dotted line indicates saturation or unsaturation or pharmaceutically acceptable salts thereof with the proviso that the substituents on the thiazolyl ring are not adjacent.

6. A method of treating persons afflicted with with calcium oxalate renal lithiasis or preventing the formation of calcium oxalate kidney or bladder stones which comprises administration to such patients an effective amount of compound having the structure:



wherein n is 0 to 2, the dotted line indicates saturation or unsaturation or pharmaceutically acceptable salts thereof with the proviso that the substituents on the thiazolyl ring are not adjacent.

4,377,589

SUBSTITUTED 2-ALKYLIMINO-3-ALKYL-4-BENZHYDRYL-4-THIAZOLIDINOLS

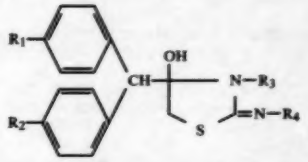
Andrew S. Tomcufcik, Old Tappan; William B. Wright, Jr., Woodcliff Lake, both of N.J., and Joseph W. Marsico, Jr., Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 9, 1981, Ser. No. 252,529

Int. Cl.³ C07D *277/04*; A61K *31/425*

U.S. Cl. 424—270 **8 Claims**

1. A compound selected from the group consisting of the formula:



wherein R_1 is hydrogen, fluoro or chloro, R_2 is hydrogen, fluoro or chloro R_3 is alkyl having up to 4 carbon atoms, and R_4 is alkyl having up to 4 carbon atoms; and the pharmacologically acceptable acid-addition salts thereof.

4,377,590

DERIVATIVES OF AMPICILLIN AND AMOXICILLIN WITH BETA-LACTAMASE INHIBITORS

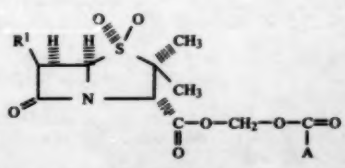
Robert F. Myers, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed May 10, 1982, Ser. No. 376,487

Int. Cl.³ A61K *31/43*; C07D *499/32*

U.S. Cl. 424—271 **21 Claims**

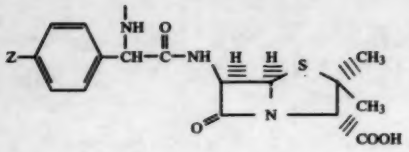
1. A compound of the formula



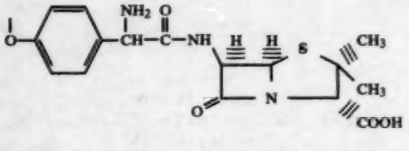
the pharmaceutically-acceptable acid addition salts thereof and the pharmaceutically-acceptable base salts thereof; wherein

R^1 is selected from the group consisting of hydrogen and hydroxymethyl; and

A is selected from the group consisting of



and



wherein Z is selected from the group consisting of hydrogen and hydroxy.

15. A pharmaceutical composition, suitable for treating a bacterial infection in a mammalian subject, which comprises an antibacterially effective amount of a compound according to claim **1** and a pharmaceutically-acceptable carrier.

4,377,591

7-OXO-1-AZABICYCLO[3.2.0]HEPT-2-ENE-2-CARBOXYLIC ACID DERIVATIVES, THEIR USE AND PREPARATION

Tetsuo Hiraoka; Takeo Kobayashi; Noboru Ishida, and Shinichi Sugawara, all of Hiromachi, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

Filed Feb. 27, 1981, Ser. No. 239,139
Claims priority, application Japan, Mar. 3, 1980, 55-26254
Int. Cl.³ C07D *487/04;* A61K *31/40*
U.S. Cl. 424—274 **14 Claims**

1. Compounds selected from the group consisting of:

3-(2-aminoethylthiomethyl)-6-(1-hydroxyethyl)-7-oxo-1-azabicyclo[3.2.0]hept-2-ene-2-carboxylic acid;

3-(2-formimidoylaminoethylthiomethyl)-6-(1-hydroxyethyl)-7-oxo-1-azabicyclo[3.2.0]hept-2-ene-2-carboxylic acid;

3-(2-amino-1-methylethyl)thiomethyl-6-(1-hydroxyethyl)-7-oxo-1-azabicyclo[3.2.0]hept-2-ene-2-carboxylic acid;

3-(2-formimidoylamino-1-methylethyl)thiomethyl-6-(1-hydroxyethyl)-7-oxo-1-azabicyclo[3.2.0]hept-2-ene-2-carboxylic acid;

3-(3-aminopropylthiomethyl)-6-(1-hydroxyethyl)-7-oxo-1-azabicyclo[3.2.0]hept-2-ene-2-carboxylic acid;

3-(3-formimidoylaminopropylthiomethyl)-6-(1-hydroxyethyl)-7-oxo-1-azabicyclo[3.2.0]hept-2-ene-2-carboxylic acid;

3-(2-aminoethylsulphinylmethyl)-6-(1-hydroxyethyl)-7-oxo-1-azabicyclo[3.2.0]hept-2-ene-2-carboxylic acid;

3-(2-formimidoylaminoethylsulphinylmethyl)-6-(1-hydroxyethyl)-7-oxo-1-azabicyclo[3.2.0]hept-2-ene-2-carboxylic acid;

3-(2-amino-1-methylethyl)sulphinylmethyl-6-(1-hydroxyethyl)-7-oxo-1-azabicyclo[3.2.0]hept-2-ene-2-carboxylic acid;

3-(2-formimidoylamino-1-methylethyl)sulphinylmethyl-6-(1-hydroxyethyl)-7-oxo-1-azabicyclo[3.2.0]hept-2-ene-2-carboxylic acid;

3-(2-aminoethylsulphonylmethyl)-6-(1-hydroxyethyl)-7-oxo-1-azabicyclo[3.2.0]hept-2-ene-2-carboxylic acid;

3-(2-formimidoylaminoethylsulphonylmethyl)-6-(1-hydroxyethyl)-7-oxo-1-azabicyclo[3.2.0]hept-2-ene-2-carboxylic acid;

3-(2-amino-1-methylethyl)sulphonylmethyl-6-(1-hydroxyethyl)-7-oxo-1-azabicyclo[3.2.0]hept-2-ene-2-carboxylic acid;

3-(2-formimidoylamino-1-methylethyl)sulphonylmethyl-6-(1-hydroxyethyl)-7-oxo-1-azabicyclo[3.2.0]hept-2-ene-2-carboxylic acid;

pivaloyloxymethyl 3-(2-aminoethylthiomethyl)-6-(1-hydroxyethyl)-7-oxo-1-azabicyclo[3.2.0]hept-2-ene-2-carboxylate;

pivaloyloxymethyl 3-(2-formimidoylaminoethylthiomethyl)-6-(1-hydroxyethyl)-7-oxo-1-azabicyclo[3.2.0]hept-2-ene-2-carboxylate;

pivaloyloxymethyl 3-(2-amino-1-methylethyl)thiomethyl-6-(1-hydroxyethyl)-7-oxo-1-azabicyclo[3.2.0]hept-2-ene-2-carboxylate; and

pivaloyloxymethyl 3-(2-formimidoylamino-1-methylethyl)-thiomethyl-6-(1-hydroxyethyl)-7-oxo-1-azabicyclo[3.2.0-]hept-2-ene-2-carboxylate; and

pharmaceutically accepted salts of said carboxylic acids.

13. A pharmaceutical composition comprising an antibiotically effective amount of at least one compound of any one of claims **1, 2, 3, 4, 5, 6, 7, 8, 9,** or **12** together with a pharmaceutically acceptable carrier.

4,377,592

ANTIARRHYTHMIC ACTIVITY OF CETIEDIL

Michel E. M. Aurousseau, Paris, France, assignor to Inothera, Arcueil, France

Filed Oct. 23, 1979, Ser. No. 88,198
Int. Cl.³ A61K *31/38*
U.S. Cl. 424—275 **3 Claims**

1. A method for treating a patient for cardiac arrhythmia which comprises administering to the said patient a therapeutically effective dose of cetiedil, the mode of administration being oral or injection.

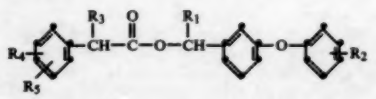
4,377,593

α-ISOPROPYL- AND α-CYCLOPROPYLPHENYLACETATES AND USE THEREOF IN PEST CONTROL

Peter Ackermann, Reinach; Laurenz Gsell, Basel, and Rudolf Wehrli, Rheinfelden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 19, 1982, Ser. No. 350,452
Claims priority, application Switzerland, Feb. 26, 1981, 1297/81; Oct. 13, 1981, 6539/81
Int. Cl.³ A01N *13/12, 37/34;* C07C *69/612, 121/75*
U.S. Cl. 424—282 **10 Claims**

1. An α-isopropyl- or α-cyclopropylphenylacetate of the formula



(I)

wherein R_1 is hydrogen, cyano, —$CSNH_2$, allenyl, C_2–C_3alkenyl or C_2–C_3alkynyl, R_2 is unsubstituted or substituted alkenyl or alkynyl, R_3 is isopropyl or cyclopropyl, and each of R_4 and R_5 is halogen, C_1–C_4alkyl, C_1–C_4haloalkyl, C_1–C_4alkoxy, C_1–C_4haloalkoxy, or both together are the methylenedioxy radical.

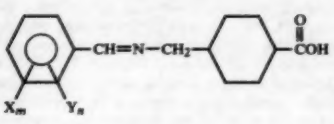
10. A method of controlling pests of animals and plants, which comprises applying thereto a pesticidally effective amount of a compound according to claim **1.**

4,377,594
DERIVATIVE OF 4-(N-(SUBSTITUTED-BENZYLIDENE)AMINO-METHYL CYCLOHEXANE-1-CARBOXYLIC ACID

Hitoshi Takita; Yutaka Mukaida; Sakuo Noda, and Hidetoshi Kobayashi, all of Tokyo, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 26, 1981, Ser. No. 267,249
Claims priority, application Japan, Jun. 4, 1980, 55-75055; Jan. 9, 1981, 56-1790
Int. Cl.³ C07C *101/30*; A61K *31/195*
U.S. Cl. 424—309 13 Claims

1. A compound represented by the formula (I):



(I)

wherein

X is hydroxyl- or methoxy group,

Y is hydrogen or hydroxyl or methoxy group,

m and n are positive integers and the sum of m and n is equal to or less than 5,

or a pharmaceutically acceptable salt thereof selected from the group consisting of sodium-, potassium-, calcium-, magnesium-, primary ammonium-, secondary ammonium-, tertiary ammonium- and quarternary ammonium salts or a pharmaceutically acceptable alkyl ester thereof having 1 to 3 carbon atoms in said alkyl group, provided that 4-[N-(3',4'-dihydroxybenzylidene)aminomethyl]cyclohexane-1-carboxylic acid is not included in the formula (I).

13. A pharmaceutical composition in dosage unit form for inhibiting platelet aggregation or polynuclear leukocyte migration comprising an effective amount of at least one compound of claim 1, and a pharmaceutically acceptable carrier or adjuvant.

4,377,595
PROCESS FOR REDUCING DEPRESSION

Richard J. Wurtman, Waban, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 66,158, Aug. 13, 1979, which is a continuation-in-part of Ser. No. 895,740, Apr. 24, 1978, abandoned. This application May 29, 1980, Ser. No. 154,189
Int. Cl.³ A61K *31/195*
U.S. Cl. 424—319 2 Claims

1. The process for alleviating depression in a depressed human patient which comprises administering to the patient a neutral amino acid composition containing tyrosine in an amount effective to regulate blood plasma levels of tyrosine to form corresponding amounts of norepinephrine released in synapsis in the brain.

4,377,596
METHOD FOR INCREASING MILK PRODUCTION

Howard J. Larsen, Marshfield, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation of Ser. No. 89,992, Oct. 31, 1979, abandoned, which is a continuation of Ser. No. 877,860, Feb. 15, 1978, abandoned. This application Aug. 15, 1980, Ser. No. 178,509
Int. Cl.³ A23K *1/12*
U.S. Cl. 426—2 3 Claims

1. In a method of feeding high producing dairy cows having an average milk production of at least 54 pounds of fat corrected milk per day the improvement consisting of feeding said dairy cows a nutritionally balanced feed containing spent sulfite liquor in an amount of 0.25–3.0% by weight on a dry weight basis to increase milk production of said dairy cows.

4,377,597
RESTRUCTURED MEAT PRODUCT FOR ROASTING AND METHOD OF PREPARING SAME

Jay H. Shapiro, and Bernard J. Peck, both of Milwaukee, Wis., assignors to Peck Meat Packing Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 151,974, May 21, 1980, abandoned. This application Jan. 13, 1982, Ser. No. 339,137
Int. Cl.³ A23L *1/31*
U.S. Cl. 426—92 4 Claims

1. A method of preparing a restructured meat product from meat which has not been mechanically tenderized, which product, when roasted and sliced, has the flavor, appearance and texture of a natural roast, said method consisting essentially of:

(a) treating untenderized lean meat pieces, comprising at least 20% and up to about 40% elongated thin strips and about 60% to about 80% lean meat chunks, with an aqueous solution of salt and phosphate to extract myosin from the striated muscle in the meat and to cause the myosin to rise to the outer surfaces of the strips and chunks;

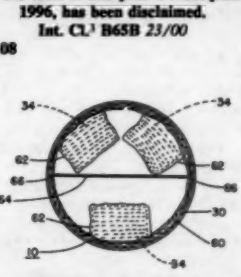
(b) interspersing the strips between and intertwining the strips about the chunks; and then

(c) forming the resulting strip-chunk mixture into a restructured meat product of a desired shape for roasting, said product being held in the desired shape by the physical tying action of the elongated strips, which are interspersed between and intertwined about the chunks of meat, and the adhesive nature of the myosin.

4,377,598
PACKAGE FOR PROTECTING FRIABLE PRODUCTS

Frank J. Nugent, Ridgefield, Conn., assignor to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 833,205, Sep. 14, 1977, Pat. No. 4,156,022. This application Aug. 14, 1978, Ser. No. 933,432
The portion of the term of this patent subsequent to May 22, 1996, has been disclaimed.
Int. Cl.³ B65B *23/00*
U.S. Cl. 426—108 10 Claims



1. In a packaging arrangement for a generally fragile flat elongated product, the combination of:

a. a substantially rigid cylindrical container including a peelable top closure member and a bottom closure member forming a sealed container;

b. at least one product-containing pouch in said container positioned so as to conform to the inner cylindrical surface

thereof having flange means formed along the bottom edge of said pouch in yieldable contact with the bottom closure member of said container for absorbing axial shock loads imparted to said container, said pouch having a plurality of vacuum-sealed pockets circumferentially spaced along the cylindrical inner circumference of said container, with each pocket being separated from each adjacent pocket by a seam extending longitudinally along the length of said cylindrical container, each of said vacuum-sealed pockets containing respectively one stack of said friable product held immobile in said pockets and stacked to extend radially toward the center of the container, each said pocket being vertically arranged in said cylindrical container with the length of the pocket extending along the height and parallel to the longitudinal axis of said container, and the length of each friable product extending along substantially the entire length of the pocket, said pouch being formed of a resilient plastic material laminate and creased in the axial direction of said container intermediate said pockets so as to facilitate conformance thereof to the contour of the inner cylindrical surface of said container, said pouch being of a height substantially in conformance with the axial length of said container intermediate the closure members thereof so as to be restrained from axial movements within said container, said pouch extending beyond the length of the product in said pockets to thereby maintain the product in a spaced relationship from said top and bottom closure members.

4,377,599

PROCESSES FOR EMPLOYING TREATED SOLID CARBONACEOUS FOSSIL FUELS

John W. Willard, Sr., Rapid City, S. Dak., assignor to Caw Industries, Inc., Rapid City, S. Dak.

Division of Ser. No. 896,241, Apr. 14, 1978, Pat. No. 4,237,101, which is a division of Ser. No. 593,712, Jul. 7, 1975, Pat. No. 4,084,938, which is a continuation-in-part of Ser. No. 317,097, Dec. 20, 1972, Pat. No. 3,893,943, which is a continuation of Ser. No. 108,198, Jan. 20, 1971, abandoned. This application Jul. 30, 1980, Ser. No. 173,860

The portion of the term of this patent subsequent to Jul. 8, 1992, has been disclaimed.

Int. Cl.[3] **A23B** *9/00;* **A23L** *3/34, 1/20*

U.S. Cl. 426—310 **25 Claims**

1. A method of rendering grain and forage crops useful as animal feed more palatable and digestible when fed to said animals which comprises

applying to said grain or forage crops prior to feeding to said animals an aqueous solution containing water soluble organic substances produced by intimately contacting solid fossil fuel in particulate form selected from the group consisting of coal, lignite, peat and admixtures thereof with an aqueous medium containing a catalytically effective amount of a catalyst,

the solid fossil fuel having active sites therein which react with the aqueous medium under liquid conditions in the presence of said catalyst to produce said water soluble organic substances, and

the particles of the solid fossil fuel being intimately contacted with the aqueous medium under liquid conditions in the presence of said catalyst until active sites of said fuel react with the aqueous medium to produce said water soluble organic substances,

the catalyst being prepared by a process comprising

admixing a water soluble alkali metal silicate with an aqueous medium containing a dissolved substance which is a source of calcium ion and a dissolved substance which is a source of magnesium ion,

the aqueous medium containing said dissolved substances in amounts to provide between about 1×10^{-4} and 1×10^{-1} mole per liter each of calcium ion and magnesium ion,

the aqueous medium containing said dissolved substances in amounts to provide a molar ratio of calcium ion to magnesium ion between about 2.0:1.0 and 1.0:2.0,

the alkali metal silicate having an alkali metal oxide to silicon dioxide ratio between about 0.9:1.0 and less than 2.0:1.0 and being admixed with the aqueous medium in an amount of about 0.05–2 moles per liter,

reacting the alkali metal silicate with said dissolved substances providing calcium ion and magnesium ion to produce an aqueous suspension of finely divided particles of the reaction product;

admixing a micelle-forming surfactant with the aqueous medium in an amount to form catalyst micelles comprising said finely divided particles upon agitating the aqueous medium, and

agitating the aqueous medium containing the finely divided particles and surfactant to form said catalyst micelles.

7. In a method of storing grain and forage crops useful as animal feed wherein said grain and forage is held in non-airtight storage while awaiting feeding said grain and forage to said animals, the improvement in combination therewith which comprises applying to said grain or forage crops an aqueous solution containing water soluble organic substances produced by intimately contacting solid fossil fuel in particulate form selected from the group consisting of coal, lignite, peat and admixtures thereof with an aqueous medium containing a catalytically effective amount of a catalyst,

the solid fossil fuel having active sites therein which react with the aqueous medium under liquid conditions in the presence of said catalyst to produce said water soluble organic substances, and

the particles of the solid fossil fuel being intimately contacted with the aqueous medium under liquid conditions in the presence of said catalyst until active sites of said fuel react with the aqueous medium to produce said water soluble organic substances,

the catalyst being prepared by a process comprising

admixing a water soluble alkali metal silicate with an aqueous medium containing a dissolved substance which is a source of calcium ion and a dissolved substance which is a source of magnesium ion,

the aqueous medium containing said dissolved substances in amounts to provide between about 1×10^{-4} and 1×10^{-1} mole per liter each of calcium ion and magnesium ion,

the aqueous medium containing said dissolved substances in amounts to provide a molar ratio of calcium ion to magnesium ion between about 2.0:1.0 and 1.0:2.0,

the alkali metal silicate having an alkali metal oxide to silicon dioxide ratio between about 0.9:1.0 and less than 2.0:1.0 and being admixed with the aqueous medium in an amount of about 0.05–2 moles per liter,

reacting the alkali metal silicate with said dissolved substances providing calcium ion and magnesium ion to produce an aqueous suspension of finely divided particles of the reaction product,

admixing a micelle-forming surfactant with the aqueous medium in an amount to form catalyst micelles comprising said finely divided particles upon agitating the aqueous medium, and

agitating the aqueous medium containing the finely divided particles and surfactant to form said catalyst micelles.

4,377,600

METHOD FOR PRODUCING DEODORIZED LIQUID GARLIC EXTRACT

Mitsuhiro Morinaga, Fukuoka, Japan, assignor to Mitsuteru Tomoda, Hyogo, Japan

Filed Oct. 30, 1981, Ser. No. 316,471

Int. Cl.[3] **A23L** *1/221, 1/28*

U.S. Cl. 426—424 **4 Claims**

1. Method for producing deodorized liquid garlic extract substantially comprising

(i) squeezing raw garlic bulbs to produce a raw garlic juice,

(ii) holding said raw garlic juice at a temperature of above 1°

to 10° C. in a container for a first predetermined period, effective to prevent enzymatic reactions in the juice,

(iii) mixing an edible oil into said raw garlic juice,

(iv) holding said mixture in said container at a temperature of above 1° to 10° C. in said container for a second predetermined period effective to produce a precipitated liquid garlic extract which is completely free from odor, and

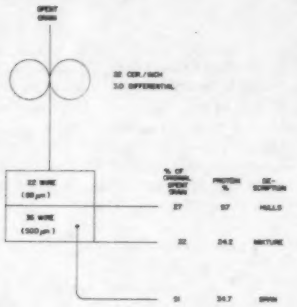
(v) collecting said precipitated liquid garlic extract from said mixture.

4,377,601

METHOD OF REMOVING HULLS FROM BREWER'S SPENT GRAIN

Patrick C. Dreese, and R. Carl Hoseney, both of Manhattan, Kans., assignors to Miller Brewing Company, Milwaukee, Wis.

Filed Sep. 4, 1981, Ser. No. 299,511
Int. Cl.³ A23B 4/04
U.S. Cl. 426—472 **2 Claims**



1. A method of preparing a bran from brewer's spent grain (BSG) which bran is suitable for use in products for human consumption comprises drying the BSG and milling the dried BSG in a roller mill having a differential of about 2.5 to about 4.0 and a tight setting so that the rollers just rub when no grain is passing through to separate the bran from the hulls, then passing the ground mixture through a sieve having openings of about 500 microns which retains the particles of hulls and collecting the product which passes through the sieve which constitutes the brewer's spent grain bran.

4,377,602

PROCESS FOR THE PREPARATION OF A HYDROLYZED PRODUCT FROM WHOLE GRAIN AND SUCH A PRODUCT

Ernst Conrad, Lyckeby, Sweden, assignor to Nordstjernan AB, Stockholm, Sweden

Continuation of Ser. No. 951,076, Oct. 13, 1978, Pat. No. 4,282,319. This application Feb. 17, 1981, Ser. No. 234,631
Claims priority, application Sweden, Oct. 18, 1977, 7711742
Int. Cl.³ A23J 1/12; A23L 1/195
U.S. Cl. 426—656 **2 Claims**

1. A hydrolyzed protein and starch product prepared according to the process for preparing in situ, enzymatically hydrolyzed protein and starch products from whole grain, comprising crushing said grain and thereafter subjecting the crushed grain to a treatment which consists essentially of both the following steps:

(a) subjecting said grain to an enzymatic treatment in an aqueous medium with an endopeptidase so as to transform substantially all water-insoluble proteins present in the grain to water-soluble protein products, which thereafter are filtered and recovered from the crushed grain as a clear filtrate containing protein products containing about 50 to 60% peptides having at least 25 amino acid residues, 35 to 45% peptides having between about 5 to 20 amino acid residues and 4–8% peptides having up to 4 amino acid residues and subjecting the remaining crushed grain to

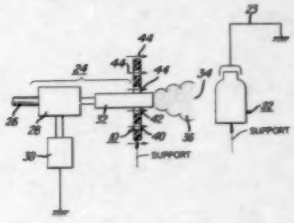
(b) an enzymatic treatment in an aqueous medium with α-amylase followed sequentially by an amyloglucosidase both enzymes substantially free from other carbohydrate hydrolyzing enzymes so as to transform substantially all the water-insoluble starch fraction in the grain to water-soluble, degraded products of starch, wherein the amyloglucosidase is at a pH of between 4 to 4.5, so as to transform substantially all the water-insoluble starch fractions in the grain to glucose.

4,377,603

METHOD AND APPARATUS FOR ELECTROSTATIC POWDER COATING

Tsutomu Itoh, Tokyo; Nobuo Furuya; Kenji Ouchi, both of Chiba; Takeo Shimizu, Tokyo, and Hiroshi Saitoh, Chiba, all of Japan, assignors to Onoda Cement Company, Limited, Japan

Continuation of Ser. No. 849,394, Nov. 7, 1977, abandoned. This application Nov. 1, 1979, Ser. No. 90,395
Claims priority, application Japan, Nov. 10, 1976, 51-134159
Int. Cl.³ B05D 1/06
U.S. Cl. 427—25 **11 Claims**



1. An electrostatic coating method for coating a workpiece with chargeable powder particles, comprising the steps of:

supporting a workpiece to be coated with powder particles and a silent discharge plate electrode in a spaced opposed relationship;

applying a d.c. voltage across the workpiece and said silent discharge plate electrode to establish an electric field in a space therebetween; applying an a.c. voltage to said silent discharge plate electrode across two spaced points thereon;

introducing into said space between the silent discharge plate electrode and the workpiece for coating the workpiece charged powder particles having the same polarity as the silent discharge plate electrode,

prior to introducing the charged powder particles into said space fully charging the particles to be coated on the workpiece externally of said space and with a separate d.c. voltage independent of the first-mentioned d.c. voltage and in the same polarity as that of the silent discharge electrode with a sufficient charge of said polarity on the maximum number of particles charged to effectively have the charged powder particles driven toward the workpiece when introduced into said electric field; and

said a.c. voltage being applied to effectively repel the charged powder particles from an electrode surface confronting said space and to maintain silent discharge at the electrode surface very small to effectively prevent neutral uncharged particles and particles charged oppositely to said polarity from depositing on said surface of the silent discharge electrode, whereby the powder particles in said space are driven toward the workpiece to coat the workpiece and prevented from accumulating on said silent discharge electrode surface.

4,377,604
COPPER STABILIZED DIPPING SOLUTION FOR A PHOTOVOLTAIC DEVICE INCORPORATING A Cu_xS LAYER

Ronald A. Schneider, Albany, Calif., assignor to Chevron Research Company, San Francisco, Calif.

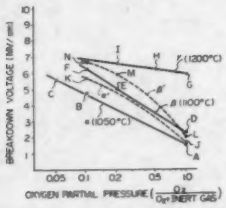
Filed Jun. 17, 1981, Ser. No. 274,337
Int. Cl.³ H01L 31/18, 31/02; B05D 1/36
U.S. Cl. 427—75 9 Claims

1. A method of fabricating a solar cell comprising:
(a) dipping an electrically conductive substrate having a layer of cadmium sulfide deposited thereon into a cuprous ion solution in contact with metallic copper for a sufficient time to form a layer of Cu_xS thereon; and
(b) fabricating an electrical contact to the resulting Cu_xS layer.

4,377,605
METHOD FOR FORMING AN INSULATING LAYER ON A POLYCRYSTALLINE SILICON LAYER OF A SEMICONDUCTOR DEVICE USING A TWO-STEP THERMAL OXIDATION TECHNIQUE

Takashi Yamamoto, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed May 18, 1981, Ser. No. 264,815
Claims priority, application Japan, May 19, 1980, 55-65233
Int. Cl.³ H01L 21/316
U.S. Cl. 427—93 9 Claims



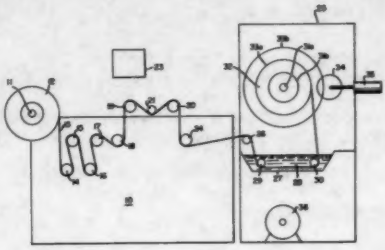
1. A method for forming an insulating layer on a polycrystalline silicon layer in a semiconductor device, comprising the steps of:
a. heating the polycrystalline silicon layer at a first temperature in an ambient gas, including an oxidizing gas comprising oxygen and an inert gas, for a first predetermined period of time to effect initial oxidation of the polycrystalline silicon layer;
b. heating the polycrystalline silicon layer at a second temperature which is greater than the first temperature, in the ambient gas for a second predetermined period of time to further oxidize the polycrystalline silicon layer, so that the insulating layer is formed; and
c. cooling the formed insulating layer to the first temperature in the inert gas.

4,377,606
LIQUID SMOKE-IMPREGNATION OF FIBROUS FOOD CASINGS

Herman S. Chiu, Chicago, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 11, 1981, Ser. No. 301,276
Int. Cl.³ B05D 3/12; B29D 7/24, 7/26
U.S. Cl. 427—172 18 Claims

1. A method for manufacturing a wood-derived liquid smoke impregnated fibrous cellulosic casing comprising the steps of:
(a) providing a dry stock fibrous cellulosic casing in flattened form;
(b) providing a source of wood-derived liquid smoke having color, odor and flavor constituents;
(c) moving said flat fibrous casing through a liquid smoke coating zone and contacting at least one outer surface of the moving flat fibrous casing with said liquid smoke under conditions to coat said surface but not substantially impregnate the casing wall;
(d) moving the liquid smoke coated flat casing from said coating zone to a reeling zone;

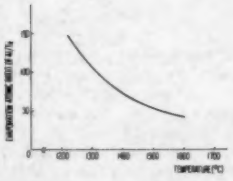


(e) winding the liquid smoke coated flat casing in the reeling zone into a rotating roll of overlying layers under conditions sufficient to trap the liquid smoke coating between adjacent layers of casing in the roll; and
(f) continuing the rotation of the liquid smoke coated casing roll under conditions such that at least a portion of the liquid smoke impregnates each layer wall of said casing.

4,377,607
PROCESS FOR PRODUCING VACUUM DEPOSITION FILMS

Satoshi Yoshida; Hideaki Takeuchi; Masamichi Shigyo; Toshio Iijima, and Tomoaki Ikeda, all of Asaka, Japan, assignors to Fuji Photo Film Company, Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 96,270, Nov. 21, 1979, abandoned. This application May 1, 1981, Ser. No. 259,753
Claims priority, application Japan, Nov. 21, 1978, 53-143859
Int. Cl.³ C23C 11/00, 13/00
U.S. Cl. 427—250 7 Claims



1. In a process for producing vacuum deposition films which comprises providing a vacuum deposition film composed of an alloy or an intermetallic compound of two or more components having different vapor pressures at a specified temperature on a base, the improvement which comprises charging the component having the lower vapor pressure at said temperature to an evaporation source in a vacuum evaporation chamber in such an amount that the evaporation amount thereof per unit time does not substantially vary, and carrying out vacuum evaporation while continuously feeding a component having a higher vapor pressure at said temperature into said evaporation source in an amount such that said components in said evaporation source maintain a definite composition thereby to obtain a definite composition of said deposited film.

4,377,608

METHOD OF MODIFYING A SUBSTRATE

William H. Daudt; Cecil L. Frye, both of Midland, Mich., and James F. Hyde, Marco Island, Fla., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 78,415, Sep. 24, 1979. This application Jun. 26, 1981, Ser. No. 277,767
Int. Cl.³ A23F 3/00, 5/00
U.S. Cl. 427—350 24 Claims

1. A method of modifying a substrate, the method comprising the steps of:

(A) applying to the substrate an aqueous metal ammine siliconate solution comprising the reaction products of

(a) oxides and hydroxides of metal, metal derivatives or mixtures thereof which are selected from a group consisting essentially of metals of group IB and metals of group IIB of the Periodic Table of the Elements, which are not more acidic than the silanols or siloxanols produced in (c), which dissolve in the reaction mixture to yield metal ammine cations in the presence of R—NH_2;

(b) R—NH_2 where R is H, aminoalkyls with 2–6 carbon atoms, or mixtures thereof and wherein the —NH_2 molar concentration is equal to at least n times the molar concentration of the metal or metal derivative where n is the coordination number of the metal;

(c) a mono-organosilicon material which can undergo hydrolysis in the presence of the other reactants to yield mono-organnosilanols or siloxanols and hydrolysis products which are not more acidic than the silanols or siloxanols wherein the organo moiety in the mono-organosilicon material contains up to about 50 carbon atoms and is selected from the group consisting of saturated and unsaturated hydrocarbons having from 1 to about 6 carbon atoms, halohydrocarbons having up to 6 carbon atoms and wherein the halo substitution is at a location other than the alpha or beta locations, aminohydrocarbons, radicals containing one or more ether or thioether linkages, hydroxyfunctional alkyl radicals, carbomethoxyalkyl radicals, carbamoyalkoxy radicals, quaternary ammonium or phosphonium bearing alkyl radicals and mixtures thereof, the mono-organosilicon material being present in an amount sufficient to yield a silicon/metal ratio of from about 1 to about 10; and

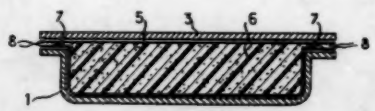
(d) water; and (B) evaporating the volatiles.

4,377,609

PROCESS FOR MANUFACTURING A PADDING COMPRISING A FOAM BODY COVERED WITH A PERMEABLE COVER, MADE FOR EXAMPLE FROM FABRIC

Michel Bartoli, Etampes; Armand R. Bernard, Mespuits, and Daniel Noirot, Etampes, all of France, assignors to Societe Industrielle Bertrand Faure, Etampes, France

Filed Apr. 7, 1980, Ser. No. 137,634
Claims priority, application France, Apr. 26, 1979, 79 10679
Int. Cl.³ B29D 27/04
U.S. Cl. 428—71 4 Claims



2. A process for manufacturing padding having a body made from foam covered with a permeable cover and using a foaming composition in a liquid reaction state prior to a final expanded state and at least first and second complimentary mold parts defining a molding cavity and each of said first and second complimentary mold parts further comprising a peripheral lip portion disposed around the outer periphery of said first and second complimentary mold parts for securing said cover and said foaming composition therebetween, and at least first and second permeable cover elements, which comprises:

placing said first permeable cover element on the internal surface of said first mold part to form a first mold part lining;

extending the periphery of said first permeable cover element over said peripheral lip portion of said first mold part;

placing said second permeable cover element on the internal surface of said second mold part to form a second mold part lining;

extending the periphery of said second permeable cover element over said peripheral lip portion of said second mold part;

pouring said foaming composition in said liquid reaction state onto at least first permeable cover element of said first mold part such that said foaming composition does not penetrate said first and second permeable cover elements;

expanding said foaming composition so as to at least overflow slightly from said first mold part such that at least one rim portion of said foaming composition extends over said first permeable cover element so as to at least partially overlap and cover the periphery of said first permeable cover element;

placing said second mold part on said first mold part so as to form and close said molding cavity such that said at least one rim portion of said foaming composition is disposed between said peripheral lip portion of said first permeable cover element and said peripheral lip portion of said second permeable cover element;

pressing said peripheral lip portions of said first and second permeable cover elements into abutting contact such that said at least one rim portion of said foaming composition penetrates the periphery of said first and second permeable cover elements;

fully curing the foaming composition such that the fully cured foam adheres to said first and second permeable cover elements;

removing the fully cured foam and said first and second permeable cover elements from said molding cavity; and

trimming said peripheral lip portions of said first and second permeable cover elements such that said first and second permeable cover elements are flush along a line where said first and second permeable cover elements abut.

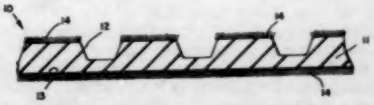
4. Padding in accordance with the method of claim 2.

4,377,610

NON SLIDABLE BOTTOM SURFACE FOR A FLOOR COVERING

Eugene F. McClung, Jr., 49 La Senda, South Laguna, Calif. 92677

Filed Nov. 5, 1981, Ser. No. 318,687
Int. Cl.³ B32B 33/00
U.S. Cl. 428—88 3 Claims



1. A bottom surface layer for a floor covering which includes a base and a top surface layer, said bottom surface layer comprising:

a. a flat member having a first surface and a second surface, with said first surface being mechanically coupled to the base of the floor covering wherein said member is formed out of a fabric material which is fixedly coupled to the base of the floor covering;

b. a plurality of nylon bristles which are electrostaticly flocked onto said second surface of said member; and

c. bonding means for permanently bonding said plurality of nylon bristles to said second surface of said member, whereby said plurality of nylon bristles lock into a carpet on a floor and prevent lateral sliding of the floor covering when the feet of a sitting person produce downward and lateral forces on the floor covering.

4,377,611

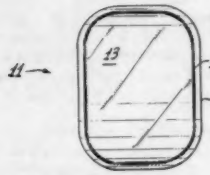
PLASTIC TRANSPARENCIES HAVING IMPROVED RESISTANCE TO CRACKING

William F. Fischer, Orange, and Charles A. Bailey, II, Santa Ana, both of Calif., assignors to Swedlow, Inc., Santa Ana, Calif.

Filed Dec. 29, 1980, Ser. No. 220,958

Int. Cl.³ B32B *23/02*

U.S. Cl. 428—192 **7 Claims**



1. A transparency having improved resistance to crazing and cracking when exposed to an environment of variable humidity, the transparency comprising:

a transparent, plastic sheet member having a peripheral edge surface, the sheet member being formed of a multiaxially oriented material that is absorptive of moisture, the volume of the sheet member varying in accordance with the amount of moisture absorbed; and

a thin, resinous coating overlying the peripheral edge surface of the sheet member and in direct contact with it, the resinous coating having a moisture permeation rate substantially lower than that of the underlying sheet member, whereby the magnitude of any moisture gradient adjacent the edge surface, caused by an environment of variable humidity, is reduced and the concomitant incidence of crazing and cracking in the transparency is correspondingly reduced.

4,377,612

ELECTROGRAPHIC RECORDING MATERIAL

Irving Serlin, and Donald M. Gardner, both of Springfield, Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed May 22, 1981, Ser. No. 266,541

Int. Cl.³ B32B *7/02;* **G01D** *15/06*

U.S. Cl. 428—212 **14 Claims**

1. An electrographic recording material comprising a conductive sheet support coated on at least one side with an electrically insulating layer comprising an intimate blend of a polymeric binder and from 200 to 1000 parts by weight of a finely divided non-photoconductive pigment per 100 parts by weight of the polymeric binder; wherein the polymeric binder comprises a major proportion of a low molecular weight interpolymer and a minor proportion of a high molecular weight interpolymer; wherein the low molecular weight interpolymer comprises from about 40 to about 85 parts by weight of monovinyl aromatic monomer units and from about 15 to about 60 parts by weight of units of a C_3–C_7 allylic alcohol and of a C_3–C_7 allylic alcohol ester of a monocarboxylic acid, the mol ratio of monovinyl aromatic units to allylic alcohol and allylic ester units being about 3:1 or less, the mol ratio of allylic ester units to allylic alcohol units being in the range of 0 to about 10, the number average molecular weight of the interpolymer being in the range of about 700 to about 5000 and the glass temperature of the interpolymer being at least about 30° C.; wherein the high molecular weight interpolymer has a number average molecular weight in the range of about 5,000 to about 100,000; and wherein the weight ratio of low molecular weight interpolymer to high molecular weight interpolymer is in the range of about 99:1 to about 70:30.

4,377,613

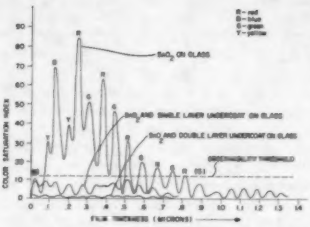
NON-IRIDESCENT GLASS STRUCTURES

Roy G. Gordon, 22 Highland St., Cambridge, Mass. 02138

Filed Sep. 14, 1981, Ser. No. 302,216

Int. Cl.³ B32B *7/02, 15/00;* **B05B** *5/00;* **B05D** *5/06*

U.S. Cl. 428—212 **11 Claims**



1. In a non-iridescent, transparent, sheet structure of the type comprising

(A) a transparent substrate,

(B) an infra-red reflective coating and

(C) an iridescence-suppressing interlayer means between said substrate and infra-red-reflective coating, the improvement whereby said structure comprises, between said infra-red-reflective coating and said transparent substrate, an interlayer comprising

(1) a first interlayer component of relatively high refractive index material, nearer to said substrate;

(2) over said relatively high refractive index material, a second interlayer component of relatively low refractive index material, and

(3) the combined interlayer components for said iridescence-suppressing means having a total optical thickness of about 1/6th of a 500 nanometer design wavelength.

4,377,614

FLOOR MAT, ESPECIALLY FOR MOTOR VEHICLES

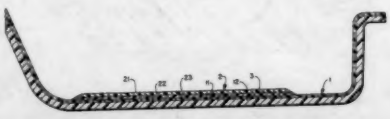
Franz-Werner Alfter, and Hans-Ulrich Breitscheidel, both of Siegburg, Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Nov. 10, 1980, Ser. No. 205,253

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1979, 2945285

Int. Cl.³ B32B *7/02, 7/04, 5/18*

U.S. Cl. 428—213 **11 Claims**



1. A floor mat comprised of cross-linked polyolefin foam for the lining of the floor interiors of motor vehicles, which comprises a cross-linked polyolefin foam floor mat base having at least one preselected surface area covered with a permanently applied floor-protecting surface layer comprised of a cross-

linked polyolefin foam layer made of the same polyolefin as the polyolefin forming said polyolefin foam floor mat base and a thermoplastic polymeric film which is heatable in a high-frequency electrical field in dielectric fashion and which exhibits wear resistance superior to the cross-linked polyolefin foam layer and the foam floor mat base, said thermoplastic polymeric film being a film of a polymeric material with a dielectric constant of 2.5 to 6 and a dielectric loss factor greater than 1.5×10^{-3} and being formed of a polymer selected from the group consisting of polyvinylchloride, a soft polyvinylchloride, an ABS polymer, an ethylene copoloymer and a polyamide; said polymeric film and the polyolefin foam layer being bonded together to form said floor-protective surface layer by an adhesion promoter which is cross-linkable under the influence of heat and the polyolefin foam layer of the floor protecting surface layer being in contact with and bonded to an upper surface of the floor mat base, with the upper surface of the floor mat base and the polyolefin foam layer being melted and being homogeneously welded together by heat generated by the application of a high-frequency electrical field to the polymeric film; said cross-linked polyolefin foam floor mat base being preshaped to conform to the contours of the floor interior of a motor vehicle.

8. A floor mat according to claim 1, wherein the floor mat base is made of two sheets of chemically cross-linked polyethylene foam, said sheets being joined flush together, whereby the polyethylene foam sheet that forms the side exposed to wear has a density of 150 to 200 kg/m^3 and a thickness of 2 to 5 mm, and the polyethylene foam sheet that forms the back side has a density of 30 to 70 kg/m^3 and a thickness of 4 to 10 mm.

4,377,615

NONWOVEN FABRICS AND METHOD OF PRODUCING THE SAME

Migaku Suzuki, and Takamitsu Igaue, both of Kawanoe, Japan, assignors to Uni-Charm Corporation, Ehime, Japan

Filed Sep. 14, 1981, Ser. No. 302,152
Claims priority, application Japan, Sep. 20, 1980, 55-131128
Int. Cl.^{3} A61F *13/16*; B32B *5/26, 5/28*
U.S. Cl. 428—213 **14 Claims**

1. In a nonwoven fabric comprising an upper layer having a substantially smooth surface and a lower layer having a density lower than in said upper layer, the improvement which comprises a structure wherein said upper layer contains 80 to 100 percent hydrophobic fibers by weight of its constitutional fibers, denier thereof being finer than in said lower layer, and containing a larger amount of adhesive bonding materials than in said lower level; said lower layer contains 40 to 80 percent hydrophilic fibers by weight and 20 to 60 percent hydrophobic fibers by weight of its constitutional fibers and these fibers are uniformly mixed, denier thereof being coarser than in said upper layer, and containing a smaller amount of adhesive bonding materials than in said upper layer.

8. In a method of producing a nonwoven fabric comprising an upper layer having a substantially smooth surface and a lower layer having a density lower than in said upper layer, the improvement therein which comprises the steps of forming a fibrous web to be said upper layer, with 80 to 100 percent hydrophobic fibers by weight having denier finer than that of a fibrous web to be said lower layer; forming a fibrous web to be said lower layer, with a mixed fiber consisting of 40 to 80 percent hydrophilic fibers by weight and of 20 to 60 percent hydrophobic fibers by weight both having denier coarser than that of said web to be said upper layer and overlapping said webs; treating said overlapped web with a binder emulsion; treating the surface of the web of said upper layer with a binder emulsion so that said web may be provided with a larger amount of a binder than said web of said lower layer; and curing said overlapped web by forcibly pressing the web surface of said upper layer against a planar dry surface of a dryer so as to give said surface a substantially smooth finish.

4,377,616

LUSTROUS SATIN APPEARING, OPAQUE FILM COMPOSITIONS AND METHOD OF PREPARING SAME

Charles R. Ashcraft, Victor, and Hee C. Park, Fairport, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 30, 1981, Ser. No. 335,978
Int. Cl.^{3} B32B *3/26, 7/02*
U.S. Cl. 428—213 **32 Claims**

1. An opaque, biaxially oriented polymeric film structure of lustrous satin appearance comprising:

a core thermoplastic polymer matrix material within which is located a strata of voids;

positioned at least substantially within at least a substantial number of each of said voids, is at least one spherical void-initiating solid particle which is phase distinct and incompatible with said matrix material, the void-space occupied by said particle being substantially less than the volume of said void, with one generally cross-sectional dimension of said particle at least approximating a corresponding cross-sectional dimension of said void;

void-free, transparent, thermoplastic skin layers adhering to the surfaces of said core layer, said skin layers being of a thickness such that the outer surfaces thereof do not, at least substantially, manifest the surface irregularities of said core layer;

the population of voids in said core being such as to cause a degree of opacity of less than 70% light transmission;

said structure having a 45° gloss measurement greater than 100%.

7. The structure of claim 1 wherein the core thickness is from about 30 to about 85% of said structure.

4,377,617

LOUDSPEAKER DIAPHRAGM AND PROCESS FOR PRODUCING SAME

Akira Ikei, Yawata; Motoharu Akahama, Hirakata; Tokisuke Wada, Uji, and Takashi Onogi, Takarazuka, all of Japan, assignors to Onkyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 2, 1981, Ser. No. 326,446
Claims priority, application Japan, Dec. 3, 1980, 55-171153
Int. Cl.^{3} G10K *13/00*; H04R *7/00*
U.S. Cl. 428—214 **10 Claims**

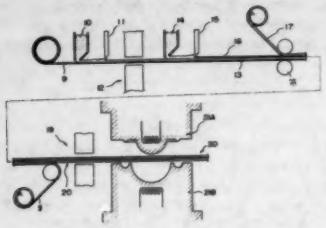
1. A dome-shaped diaphragm for loudspeakers comprising:

a substrate fabric (17) of synthetic fiber,

a polyurethane elastomer film (13) adhered to the substrate fabric (17), and

a viscoelastic resin adhesive (14) elastically adhering the substrate fabric (17) and the film (13) together.

2. A diaphragm as defined in claim 1 wherein the viscoelastic resin adhesive (14) is a polyurethane adhesive.



4. A diaphragm as defined in claim 2 wherein the polyurethane elastomer film (13) is 5 to 35 microns in thickness, and the polyurethane adhesive (14) is 5 to 15 microns in thickness.

4,377,618

INFRARED RADIATOR

Masaki Ikeda, Hirakata; Atsushi Nishino, Neyagawa, and Tadashi Suzuki, Katano, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Japan

Filed Jul. 22, 1981, Ser. No. 286,185

Claims priority, application Japan, Jul. 23, 1980, 55-101627; Sep. 3, 1980, 55-122615

Int. Cl.³ B32B *5/16, 15/02, 15/04*

U.S. Cl. 428—323 **11 Claims**

1. An infrared radiator comprising a molded mass of an infrared radiating material and a frit material both in the form of powders in a mixing ratio by weight of 0.2:1 to 9:1, the powders being fusingly bonded together.

5. An infrared radiator according to claim 1, further comprising a metallic substrate to support said molded mass.

4,377,619

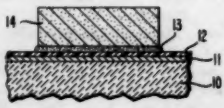
PREVENTION OF SURFACE MASS MIGRATION BY MEANS OF A POLYMERIC SURFACE COATING

Harold Schonhorn, New Providence, and Louis H. Sharpe, Morris Township, Morris County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 8, 1981, Ser. No. 261,890

Int. Cl.³ H05K *1/00;* **H01L** *21/58*

U.S. Cl. 428—333 **26 Claims**



1. Method for fabricating an article comprising a substrate having at least one first surface region covered with a substance at least part of which is capable of undergoing surface mass migration, and at least one second surface region that is not covered with the substance, the method comprising

(a) applying a layer of material to at least part of the second surface region,

characterized in that

(b) the material comprises a polymer having a critical surface tension of wetting of less than about 20 dyn/cm at room temperature, and

(c) the layer of material applied is no more than approximately 0.1 μm thick.

4,377,620

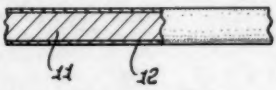
GUT FOR TENNIS RACKET AND THE LIKE AND METHOD OF MAKING SAME

Edward Alexander, 3001 Red Hill Ave., Costa Mesa, Calif. 92626

Filed Jun. 21, 1982, Ser. No. 390,241

Int. Cl.³ A63B *51/02;* **B05D** *5/08;* **D02G** *3/36;* **G10D** *3/10*

U.S. Cl. 428—372 **10 Claims**



1. Gut for a tennis racket or the like comprising a gut body and a coating film on the surface of said gut body,

said film being a dried liquid containing minute particles of ethylene tetrafluoride resin.

6. A method of forming a gut for a tennis racket or the like comprising applying to a gut body a coating film of minute particles of ethylene tetrafluoride resin dispersed in a liquid, and drying the liquid.

4,377,621

HYDROLYZED ETHYLENE VINYL ACETATE ENCAPSULATING COATING

Ronald L. Hart, Xenia; Dale E. Work, London; Daniel Davis, Casstown, and Robert G. Bayless, Yellow Springs, all of Ohio, assignors to Capsulated Systems, Inc., Fairborn, Ohio

Filed May 29, 1981, Ser. No. 268,442

Int. Cl.³ B32B *27/40;* **B05D** *3/02, 1/18*

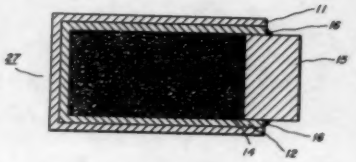
U.S. Cl. 428—425.8 **6 Claims**

1. A process for forming a highly impermeable, substantially non-porous, adherent encapsulated, coated metallic substrate which comprises applying to the entire surface of the substrate to be coated a solution comprising hydrolyzed ethylene vinyl acetate polymer having a degree of hydrolysis of about 10 to 75%, a vinyl acetate content of about 3 to 45 mole %, a molecular weight of about 30,000 to 200,000 and a melt index of about 2 to 80, a solvent, and a polyisocyanate cross-linking agent; removing the solvent and cross-linking said polymer wherein said hydrolyzed ethylene vinyl acetate polymer is prepared by reacting ethylene-vinyl acetate polymer in a hydrocarbon solvent medium with a low-boiling alcohol in an alcoholysis reaction in the presence of an acid or alkaline catalyst while regulating the water present during the course of the reaction such that it does not vary by more than 50 wt.% from the initial water content, and terminating the reaction upon hydrolyzing the polymer to the degree desired, wherein the low-boiling alcohol is reacted in an amount of about 4 to 9 times the amount stoichiometrically required for the degree of hydrolysis desired.

4,377,622
METHOD FOR PRODUCING COMPACTS AND CLADDING FROM GLASSY METALLIC ALLOY FILAMENTS BY WARM EXTRUSION

Howard H. Liebermann, Gloversville, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 25, 1980, Ser. No. 180,807
Int. Cl.³ B22F 3/00
U.S. Cl. 428—605 **34 Claims**



1. The method for consolidating glassy metallic alloy in filamentary form comprising the steps of:

(a) preparing an assembly of at least an outer metallic container having one end open and a preselected amount of intertwined filamentary glassy metallic alloy disposed substantially uniformly therein and packed to a density of from about 50% to about 60% of theoretical;

(b) closing said open end by inserting a plunger into said open end forming thereby an extrusion billet;

(c) heating said extrusion billet to a substantially uniform temperature throughout, said temperature being in the range between the plastic transition temperature and the crystallization temperature of said alloy;

(d) extruding said billet to reduce the cross section thereof by an extrusion ratio of at least about 3.5 to 1 while maintaining the temperature of said billet at a substantially uniform value throughout in the range between the plastic transition temperature and the crystallization temperature of said alloy; and

(e) recovering an extruded product of reduced cross section in which the contiguous surface areas of said intertwined filamentary glassy metallic alloy have been metallurgically bonded together by the application of inter-filament shearing forces to form a solid dense glassy metallic alloy body surrounded by and metallurgically bonded to said container.

26. The method for consolidating magnetically soft glassy metallic alloy in filamentary form while substantially maintaining the soft magnetic properties of the alloy comprising the steps of:

(a) preparing an assembly comprising at least an outer metallic container having one end open and a preselected amount of magnetically soft intertwined filamentary glassy metallic alloy disposed loosely and substantially uniformly therein by preheating said alloy to a temperature in the range between the plastic transition temperature and the crystallization temperature of said alloy and disposing said alloy in said container without causing heterogeneous plastic flow of said alloy, said container being maintained at a substantially uniform temperature throughout in the range between the plastic transition temperature and the crystallization temperature of said alloy;

(b) closing said open end by inserting a plunger preheated to a temperature in the range between the plastic transition temperature and the crystallization temperature of said alloy into said open end without compressing said magnetically soft filamentary alloy disposed therein to form an extrusion billet;

(c) extruding said heated billet to reduce the cross section thereof by an extrusion ratio of at least about 3.5 to 1 while maintaining the temperature of said billet at a substantially uniform value throughout in the range between the plastic transition temperature and the crystallization temperature of said alloy; and

(d) recovering an extruded product of reduced cross section in which the contiguous surface areas of said interwined filamentary magnetically soft glassy metallic alloy have been metallurgically bonded together by the application of inter-filament shearing forces to form a solid dense magnetically soft glassy metallic alloy body and in which the surface areas of said intertwined filamentary magnetically soft glassy metallic alloy contiguous with said container have been metallurgically bonded to said container by said shearing forces.

4,377,623
ELECTRO-CHEMICAL CELLS

Alan J. Parker, South Perth; Pritam Singh, Murdoch, and James Avraamides, Bull Creek, all of Australia, assignors to Anumin Pty. Ltd., Murdoch, Australia

Filed Jul. 15, 1981, Ser. No. 283,603
Claims priority, application Australia, Jul. 29, 1980, PE4745; Aug. 6, 1980, PE900; Mar. 11, 1981, PE949
Int. Cl.³ H01M 12/04
U.S. Cl. 429—15 **17 Claims**

1. An electro-chemical cell having an electrolyte comprising water, a halogen other than fluorine, a halide other than fluoride which is not oxidised by the halogen as a soluble salt, and a stable, saturated, organic nitrile or dinitrile containing from 2 to 5 carbon atoms or a mixture thereof, said electrolyte being composed such as to exist in two phases, a first phase being halogen and nitrile-rich and a second phase being water-rich and containing halide salt, the cell having an inert electrode in the halogen and nitrile-rich phase and an electrode, containing or contacting halogen oxidisable material, in the water-rich phase.

4,377,624
NOVEL CATHODES FOR PRIMARY SOLID ELECTROLYTE CELLS

Ashok V. Joshi, Levittown, Pa., and Charles C. Liang, Clarence, N.Y., assignors to Duracell Inc., Bethel, Conn.

Continuation of Ser. No. 945,285, Sep. 25, 1978, abandoned, which is a continuation-in-part of Ser. No. 790,726, Apr. 25, 1977, abandoned. This application Nov. 3, 1981, Ser. No. 318,077
Int. Cl.³ H01M 6/18
U.S. Cl. 429—191 **5 Claims**

1. A primary solid state electrochemical cell operable in such state at room temperature comprising a solid active metal anode, a solid electrolyte comprising a lithium salt having a room temperature ionic conductivity greater than 1×10^{-9} ohm^{-1} cm^{-1} and a solid cathode wherein said cathode consists of one or more metal chalcogenides wherein the ionic and electronic conductivity of said metal chalcogenides ranges between 10^{-10} to 10^{2} ohm^{-1} cm^{-1} at room temperature.

4,377,625
CORROSION AND HYDROGEN EVOLUTION INHIBITORS FOR CURRENT-PRODUCING CELLS HAVING ZINC ANODES

Frank E. Parsen, Weston, Mass., and Eleanor J. Roesler, Lorne Park, Canada, assignors to Duracell Inc., Bethel, Conn.

Filed Oct. 30, 1981, Ser. No. 316,598
Int. Cl.³ H01M 6/16
U.S. Cl. 429—198 **14 Claims**

1. A current-producing cell having a cathode, an anode, an electrolyte selected from the group consisting of an alkaline electrolyte having a pH greater than about 9 and an acidic electrolyte having a pH less than about 5 and at least one electrolyte-carrying separator disposed between said cathode and said anode, the combination being retained in a conductive container having a positive terminal electrically associated with said cathode and a negative terminal electrically associated with said anode, said terminals being electrically insulated

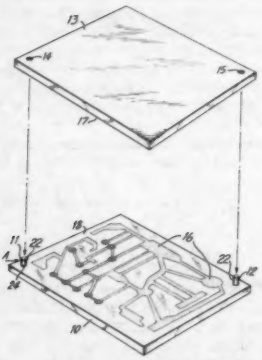
from each other, said anode being predominantly zinc; and said cell having therein a corrosion and hydrogen evolution-inhibiting amount of at least one chelating agent selected from the group consisting of aminocarboxylic acid, polyamine and aminoalcohol.

8. A process for inhibiting zinc corrosion and hydrogen evolution in a current-producing cell which has a cathode, a predominantly zinc anode, an electrolyte selected from the group consisting of an alkaline electrolyte having a pH greater than about 9 and an acidic electrolyte having a pH less than about 5, and at least one electrolyte-carrying separator comprising incorporating in said cell a zinc corrosion and hydrogen evolution-inhibiting amount of at least one chelating agent selected from the group consisting of aminocarboxylic acid, polyamine and aminoalcohol.

4,377,626
BREAKAWAY REGISTRATION PINS

Casimir J. Kurowski, Old Bridge, N.J., assignor to Western Electric Co., Inc., New York, N.Y.

Filed Aug. 4, 1981, Ser. No. 289,933
Int. Cl.³ B32B 3/10
U.S. Cl. 430—5 9 Claims



1. A breakaway registration pin extending from a hole in a surface of an article wherein the pin comprises:

a first section, having a cross-sectional area matching that of the hole but slightly undersized with respect thereto and a length no greater than the length of the hole, inserted into the hole and positioned within the hole so that a top face of the section is adjacent to the surface of the article; and

a second section extending above the surface of the article and being bonded to the top face of the first section with a bonding agent having a bond strength between the first and second sections which is less than the strength of the material of the article such that the bond between the first and second sections will break before the article, in which the first section is inserted, is damaged when a force is applied to the bonded second section.

6. A glass art master for use in placing images on a substrate and having a plurality of registration pins located in the glass for positioning the substrate on a surface of the art master, each of the registration pins comprising:

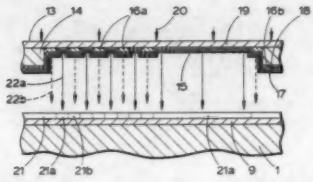
a first section embedded in a hole in the glass art master with a top face of the section adjacent to the surface of the art master; and

a second section, bonded to the top face of the first section with a bonding agent which forms a bond between the two sections such that when a force is applied to the second section the bond between the two sections will fail before the glass surrounding the hole in the art master is damaged.

4,377,627
MICROMINIATURE SOLID STATE DEVICE MANUFACTURE WITH AUTOMATIC ALIGNMENT OF SUB-PATTERNS

David J. Vinton, Burgess Hill, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 15, 1980, Ser. No. 216,340
Claims priority, application United Kingdom, Dec. 18, 1979, 7943449
Int. Cl.³ G03C 5/00; G03F 9/00; G01N 21/00; H01L 21/02
U.S. Cl. 430—22 14 Claims



1. In a method of manufacturing a microminiature solid state device comprising the step of forming at least one reference marker pattern on a surface of a semiconductor substrate, the improvement comprising the steps of forming said reference marker pattern by

exposing a layer of radiation sensitive material on said surface of said substrate to a patterned radiation beam from a mask, said mask passing a first sub-pattern of radiation and a second sub-pattern of radiation having a lower intensity than said first sub-pattern, said first sub-pattern being contained at least within a portion of said second sub-pattern, and said first sub-pattern having substantially the same configuration as said reference marker pattern,

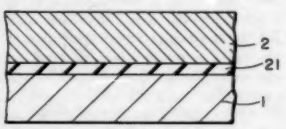
aligning said patterned radiation beam from said mask relative to said substrate so that said first sub-pattern is incident on said reference marker pattern, and

continuing exposure of said layer to determine a portion of said layer for removal, said layer being defined by the perimeter of said patterned radiation beam.

4,377,628
ELECTROPHOTOGRAPHIC MEMBER WITH α-SI AND H

Sachio Ishioka, Tokyo; Eiichi Maruyama, Kodaira; Yoshinori Imamura, Hachioji; Hirokazu Matsubara, Hamuramachi, and Shinkichi Horigome, Tachikawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 24, 1981, Ser. No. 257,346
Claims priority, application Japan, Apr. 25, 1980, 55-54150
Int. Cl.³ G03G 5/082, 5/14
U.S. Cl. 430—57 24 Claims



1. In an electrophotographic member having at least a support and a photoconductive layer of amorphous silicon containing hydrogen carried by said support, said support being made of a conductive material or an insulating material having a layer of a conductive material thereon, the improvement comprising that said photoconductive layer of an amorphous silicon containing hydrogen has at least 50 atomic % amorphous silicon and said hydrogen amounts to at least 1 atomic % and at most 50 atomic %, and that the distance between the region at which the intensity of light illuminating said photo-

conductive layer on the light incident side thereof is reduced by absorption therein to 1% of that at incidence and the surface of said photoconductive layer opposite to said light incident side thereof is at most 5 μm.

2. An electrophotographic member according to claim 1, wherein a part which is at least 10 nm thick inwardly of said photoconductive layer from a surface thereof is made of amorphous silicon which has an optical forbidden band gap of at least 1.6 eV and a resistivity of at least $10^{10}\Omega$-cm.

3. An electrophotographic member according to claim 2, wherein said photoconductive layer of an amorphous silicon containing hydrogen includes a sublayer disposed beyond a surface part of said photoconductive layer, said sublayer having an optical forbidden band gap that is smaller than that of said amorphous silicon forming said surface part, and said sublayer having a thickness of at least 10 nm.

4,377,629
LAYERED CHARGE CARRIER MEMBER AND METHOD OF FORMING IMAGE USING SAME

Noriyoshi Tarumi, Hachioji; Kiyoshi Kimura, Iruma, and Haruo Iwahashi, Fussa, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1981, Ser. No. 244,338
Claims priority, application Japan, Mar. 31, 1980, 55-42469
Int. Cl.³ G03G 5/08
U.S. Cl. 430—62 28 Claims

1. A charge carrier member comprising an intermediate layer which is formed on a support member, the intermediate layer being composed of a heat-resistant first resin containing electrically conductive material, and a charge carrier layer composed of a heat-resistant second resin formed on the intermediate layer and wherein said first resin is selected from a fluorine-containing resin, a polyimide resin, a polyimide-amide resin, a polyarylsulfone resin and a polyphenylene sulfite resin and wherein said second resin is selected from the group consisting of said first resin and polyamide.

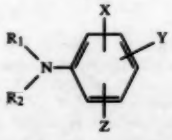
12. A method of forming a copy image which comprises forming an electrostatic latent image on the charge carrier member of claim 1, converting the electrostatic latent image into a toner image using a developing agent, and transferring the toner image onto a transfer medium.

4,377,630
PHOTOSENSITIVE COMPOSITION

Hajime Morishita, Tokyo; Takahiro Kohashi, Hachioji; Saburo Nonogaki; Motoo Akagi, both of Tokyo; Nobuaki Hayashi, and Shoichi Uchino, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 2, 1981, Ser. No. 279,849
Claims priority, application Japan, Jul. 4, 1980, 55-90650; Jun. 5, 1981, 56-85719
Int. Cl.³ G03C 1/60
U.S. Cl. 430—176 19 Claims

1. A photosensitive composition capable of being applied to a substrate as a film, where light-exposed parts thereof are capable of turning tacky to fix powders thereon, which comprises an aromatic diazonium salt which gets sticky upon exposure to light and a salt of a compound represented by the general formula:



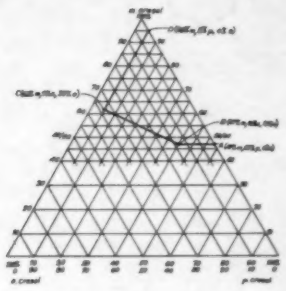
(wherein R_1 and R_2 each represents a straight chain alkyl group, X, Y and Z each represents H, a straight chain alkyl group or an alkoxy group, but two or more of X, Y and Z can not be H at the same time), wherein the amount of the salt of a compound represented by the general formula is within the range of 300–1% by weight based on the aromatic diazonium salt, whereby said salt of a compound represented by the general formula increases the photolyzing efficiency of said aromatic diazonium salt.

9. The photosensitive composition according to any of claims 1, 2 or 3, further containing an organic polymer compound in an amount within the range of 0.5–500% by weight based on the aromatic diazonium salt.

4,377,631
POSITIVE NOVOLAK PHOTORESIST COMPOSITIONS

Medhat A. Toukhy, Barrington, and Leo Kluwansky, West Warwick, both of R.I., assignors to Philip A. Hunt Chemical Corporation, Palisades Park, N.J.

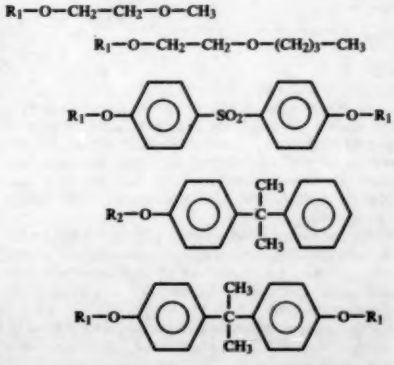
Filed Jun. 22, 1981, Ser. No. 275,883
Int. Cl.³ G03C 1/54, 1/60
U.S. Cl. 430—192 10 Claims



1. A positive photoresist composition, comprising a mixture of:

(a) about 80 to 99 percent by weight of a cresolformaldehyde novolak resin produced by condensing a mixture of cresol isomers with formaldehyde in the presence of acid, said mixture of cresols including percentages by weight of ortho-, meta-, and paracresols whose values are within the area bounded by quadrilateral ABCD in FIG. 1, said novolak resin having a softening point in the range of 110° to 145° C.; and

(b) about 1 to 20 percent by weight of at least one napthoquinone diazide sensitizer selected from the group consisting of:



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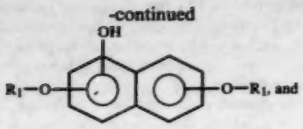
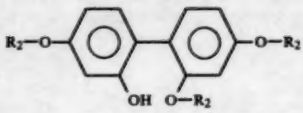
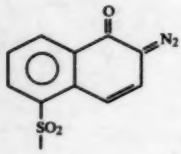
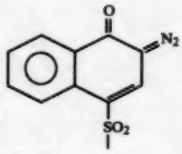




wherein

R_1 is  and

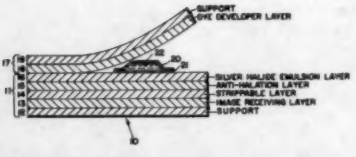
R_2 is 

4,377,632

DIFFUSION TRANSFER FILM UNITS WITH APPLICATION OF PROCESSING COMPOSITION BETWEEN DYE DEVELOPER LAYER AND SILVER HALIDE EMULSION LAYER

William J. Pflingston, Canton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 24, 1981, Ser. No. 334,168
Int. Cl.³ G03C 1/40, 5/54
U.S. Cl. 430—218 31 Claims



1. A diffusion transfer film unit comprising:

a photosensitive element comprising a first support carrying on one surface, in order, an alkaline solution permeable image-receiving layer, a strippable layer which permits separation of said image-receiving layer and said first support, as a unitary structure, from said film unit after processing thereof, and a photosensitive silver halide emulsion layer;

a dye developer element comprising a second support carrying at least one dye developer layer, said dye developer element and said photosensitive element superposed or adapted to be superposed with said first and second supports outermost; and

a rupturable container retaining an aqueous alkaline processing composition and fixedly positioned to effect, upon rupture, discharge of said processing composition between said photosensitive element and said dye developer element.

7. A film unit of claim 1 further comprising an auxiliary developing agent.

8. A film unit of claim 7 wherein said auxiliary developing agent comprises a hydroquinone moiety.

4,377,633

METHODS OF SIMULTANEOUS CONTACT AND METAL LITHOGRAPHY PATTERNING

Karen M. Abrahamovich, South Burlington; Clifford J. Hamel, Jericho; Edward H. Payne, Essex Junction, and Dean R. Weed, South Burlington, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 24, 1981, Ser. No. 295,477
Int. Cl.³ G03C 5/04, 5/00
U.S. Cl. 430—312 17 Claims

1. A photolithographic method of processing a photoresist in which both positive and reversal image processes are sequentially carried out in a single layer of positive photoresist containing a basic material, each of said image processes comprising an exposure step and a development step performed in said single layer of positive photoresist.

4,377,634

METHOD FOR FORMING HIGH CONTRAST PHOTOGRAPHIC IMAGE

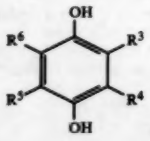
Hiroyuki Mifune; Shunji Takada; Yoshitaka Akimura, and Yoshiharu Fuseya, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 939,616, Sep. 5, 1978, abandoned. This application Mar. 11, 1980, Ser. No. 129,458
Claims priority, application Japan, Sep. 6, 1977, 52-106885
Int. Cl.³ G03C 5/30
U.S. Cl. 430—440 12 Claims

1. A method for forming a high contrast negative photographic image, which comprises imagewise exposing a photographic material comprising a support having thereon at least one photographic silver halide emulsion layer comprising substantially surface latent image type silver halide with the photographic silver halide emulsion layer or at least one hydrophilic colloid layer of the photographic material containing a compound of general formula [I]

$$R^1—NHNHCO—R^2 \quad [I]$$

wherein R^1 represents an aryl group and R^2 represents a hydrogen atom, a phenyl group or an unsubstituted alkyl group containing 1 to 3 carbon atoms, wherein the compound of general formula [I] is present in an amount of about 10^{-6} to 10^{-1} mole per mole of silver halide and a hydroquinone compound of the general formula [II]

 [II]

wherein R^3, R^4, R^5 and R^6, which may be the same or different, each represents a hydrogen atom, a sulfo group, an alkyl group, an aryl group, an aralkyl group, a heterocyclic group or a group of the formula —O—R^7 or —S—R^7, where R^7 represents an alkyl group, an aryl group, an aralkyl group or a heterocyclic group, and wherein at least one or R^3, R^4, R^5 and R^6 represents an —S—R^7 group, the amount of the compound of the general formula [II] in the photographic material being about 5×10^{-7} to 5×10^{-2} mole per mole of the silver halide, and then developing the imagewise exposed material with a

developing agent consisting essentially of a member selected from the group consisting of an aminophenol, a 3-pyrazolidone, a 1-phenyl-3-pyrazoline or hydroquinone.

4,377,635

PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

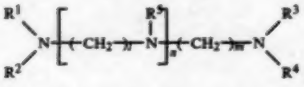
Hiroyuki Mifune; Nobuaki Inoue, both of Minami-ashigara, and Yoshiharu Fuseya, Odwara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 28, 1982, Ser. No. 382,980
Claims priority, application Japan, May 28, 1981, 56-81503
Int. Cl.³ E03C *1/02, 1/28*
U.S. Cl. 430—564 7 Claims

1. A photographic light-sensitive material, comprising:

a support base;

a silver halide emulsion layer on the support base, the emulsion layer comprising silver halide grains, wherein the grains are formed in the presence of a compound represented by the following general formula (I):



(I)

wherein l and m are 2 or 3; n is 0, 1 or 2; and R^1 to R^5 are independently an alkyl group, a hydroxyalkyl group or a carboxyalkyl group, and when n is zero, at least one substituent of R^1 to R^4 is a hydroxyalkyl group, and when n is not zero, at least two substituents of R^1 to R^5 are each a hydroxyalkyl group.

4,377,636

FERMENTATION PROCESS FOR ITS PREPARATION OF POLYSACCHARIDE S-60

Kenneth S. Kang, La Jolla, and George T. Veeder, San Diego, both of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 178,054, Aug. 14, 1980, Pat. No. 4,326,053, which is a continuation-in-part of Ser. No. 47,598, Jun. 8, 1979, abandoned, which is a continuation-in-part of Ser. No. 966,531, Dec. 4, 1978, abandoned. This application Oct. 13, 1981, Ser. No. 311,096
Int. Cl.³ C12P *19/04;* C12N *1/00;* C12R *1/38*
U.S. Cl. 435—101 4 Claims

1. A process for producing heteropolysaccharide S-60 comprising incubating the organism *Pseudomonas elodea* in a fermentation medium containing a carbon source, a source of potassium ions, a source of nitrogen, trace inorganic elements, and water at a temperature of 28°–32° C. and pH of 6–8 for 40–60 hours, and recovering the heteropolysaccharide by precipitation with a suitable lower alcohol.

4,377,637

METHOD FOR PRODUCING A LOW VISCOSITY XANTHAN GUM

William P. Weisrock, Broken Arrow, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 214,804, Dec. 8, 1980, abandoned. This application Nov. 9, 1981, Ser. No. 319,485
Int. Cl.³ C12P *19/06*
U.S. Cl. 435—104 12 Claims

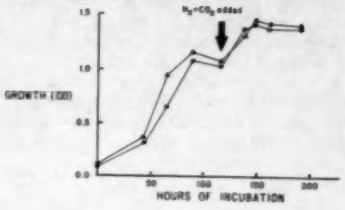
1. A process for the production of a heteropolysaccharide comprising culturing a microorganism of the genus Xanthomonas in a nutrient medium containing sulfate anion in a concentration effective to produce reduced viscosity heteropolysaccharide, said concentration being above about 0.2 wt. %.

4,377,638

MICROBIOLOGICAL PRODUCTION OF LOWER ALIPHATIC CARBOXYLIC ACIDS

Marvin P. Bryant, and Barbara R. S. Gesthner, both of Urbana, Ill., assignors to University Patents, Inc., Norwalk, Conn.

Filed Jun. 29, 1981, Ser. No. 278,678
Int. Cl.³ C12P *7/40*
U.S. Cl. 435—136 12 Claims



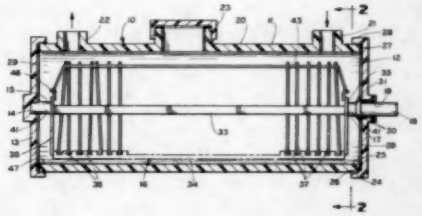
1. A process for preparing a lower aliphatic carboxylic acid of from 1 to 6 carbon atoms and/or a salt thereof which comprises culturing *Eubacterium limosum* in a nutrient medium containing at least one member of the group consisting of carbon monoxide and a mixture of hydrogen and carbon oxide under substantially anaerobic conditions.

4,377,639

TISSUE CULTURE DEVICE FOR MASS CELL CULTURE

Harold H. Lee, Toledo, Ohio, assignor to University of Toledo, Toledo, Ohio

Filed Jan. 18, 1982, Ser. No. 340,188
Int. Cl.³ C12M *3/04, 3/02, 3/00*
U.S. Cl. 435—285 7 Claims



1. A multiplate, cell propagation device for use in tissue cultures having a generally elongate enclosed vessel with two end caps and containing a plurality of spaced apart circular discs therein with means for rotating said discs within said vessel, the improvement comprising a cradle-like frame adapted for insertion within said enclosed vessel, said frame having spaced apart end plates secured opposite each other by axially extending rods spaced about the lower and lateral periphery of said end plates, a support shaft on the outer face of one of said end plates for engagement with a shaft bearing recess in the adjacent face of the cap on one end of said vessel and a drive shaft on the outer face of a sealed bearing aperture in the adjacent face of the cap on the other end of said vessel, said axially extending rods between said end plates of said frame being positioned at the lowermost and side portions of the periphery of said end plates to support said plurality of spaced apart discs therein and to permit removal thereof via the uppermost portions thereof.

4,377,640

SULPHUR GAS GEOCHEMICAL PROSPECTING

Paul M. Taufen, Golden, Colo., assignor to Texasgulf Inc., Stamford, Conn.

Filed May 20, 1981, Ser. No. 265,644
Int. Cl.³ G01N *33/24, 31/08, 21/72*
U.S. Cl. 436—32 12 Claims

1. A method of geochemical prospecting for buried sulphur mineralization which comprises:

(a) collecting a plurality of soil samples selected only from a depth beneath the zone of high plant and organic matter contribution to the composite soil and placing each said soil sample in a dark, airtight container;

(b) desorbing all bound sulphur gases from each said soil sample solely by heating each said soil sample;

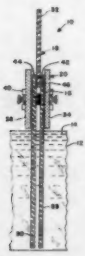
(c) analyzing said sulphur gases to determine the presence of buried sulphur mineralization.

4,377,641

METHOD AND APPARATUS FOR THE CONTINUOUS EXTRACTION OF INGREDIENTS FROM SAMPLES

Louis A. Dee, Quartz Hill, and Mary E. Fiske, Lancaster, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 22, 1981, Ser. No. 313,859
Int. Cl.³ G01N *31/06*
U.S. Cl. 436—178 6 Claims



1. A method of extracting an ingredient from a sample, comprising the steps of:

(a) holding a sample containing the ingredient to be extracted between and in contact with upper ends of a pair of first and second porous strips with a third porous strip at its lower end being inserted between and in contact with said upper ends of said first and second strips above the position of said sample therebetween;

(b) placing lower ends of said first and second strips located below said sample into a container of solvent to cause said solvent to ascend said first and second strips by capillary action, penetrate said sample, extract said ingredient therefrom, and continue to ascend said third strip toward its upper end located above said sample and carry said extracted ingredient therewith;

(c) evaporating said solvent from said upper end of said third strip to deposit said extracted ingredient thereon; and

(d) removing said third strip with said ingredient deposited thereon.

4,377,642

OVERGLAZE INKS

Ashok N. Prabhu, Plainsboro, and Kenneth W. Hang, Princeton Junction, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 6, 1981, Ser. No. 280,920
Claims priority, application United Kingdom, Oct. 17, 1980, 8033566
Int. Cl.³ H07K *3/28*
U.S. Cl. 501—20 6 Claims

1. An overglaze ink suitable for forming a protective film over an electrical circuit structure on a substrate comprising from about 60 to about 90 percent by weight of a glass powder, and from about 8 to about 35 percent by weight of a suitable organic vehicle, said glass powder consisting essentially of:

(a) from about 58 to about 66 percent by weight of lead oxide;

(b) from about 12 to about 20 percent by weight of a modifier component consisting of from about 2 to about 6 percent by weight of cadmium oxide, from about 4, to about 8 percent by weight of zinc oxide, from about 0.1 to about 3 percent by weight of barium oxide and from about 0.1 to about 3 percent by weight of antimony trioxide; and

(c) from about 20 to about 27 percent by weight of a glass forming component consisting of from about 0.1 to about 2 percent by weight of aluminum oxide, from about 14 to about 20 percent by weight of boron trioxide and from about 1 to about 7 percent by weight of silicon dioxide.

4,377,643

UPGRADING SYNTHESIS GAS

Frederick A. Pesa, Aurora, and Anne M. Graham, Northfield, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 21, 1981, Ser. No. 332,771
Int. Cl.³ C07C *1/04, 27/06*
U.S. Cl. 518—713 14 Claims

1. A process for the upgrading of synthesis gas to obtain selectivity to alkanes and alcohols comprising contacting carbon monoxide and hydrogen in the vapor phase at a reaction temperature of at least 250° C. and a reaction pressure of at least 500 psi with a catalyst of the formula

$$A_aRu_bCu_cM_dN_zO_x$$

wherein
A is an alkali metal, wherein
M is Rh, Ir, Pd, Pt or mixtures thereof and wherein
a is about 0.02 to about 0.5,
b is about 0.5 to about 3,
c is about 0.5 to about 3,
d is about 0.05 to about 0.5,
z is a level of 0 to about 1 weight % and
x is the number of oxygens needed to fulfill the valence requirements of the other elements.

4,377,644

MIXED ANHYDRIDES OF ISOCYANATES AND CARBOXYLIC ACIDS, MIXTURES THEREOF WITH CARBOXYLIC ACIDS, AND THE USE THEREOF AS BLOWING AGENTS FOR THE PRODUCTION OF CELLULAR PLASTICS

Richard Kopp, Cologne; Gerhard Grögler, Leverkusen, both of Fed. Rep. of Germany, and Max Mann, Forest Green, Pa., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 16, 1981, Ser. No. 312,034
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1980, 3041589
Int. Cl.³ C08G *18/14*
U.S. Cl. 521—94 15 Claims

1. In a process for the preparation of cellular plastic products

comprising blowing said plastic with a blowing agent, the improvement wherein said blowing agent comprises a mixed anhydride which has a melting point of at least 40° C. and is obtained by the reaction of (a) mono- and/or polyisocyanates bound to aliphatic, cycloaliphatic or araliphatic radicals and (b) weak mono- and/or polycarboxylic acids with PK_1-values of from 4 to 7, and wherein said blowing agent is used in a quantity of from 0.05 to 20% by weight, and the blowing of said plastic is carried out at temperatures above 100° C.

4,377,645

DIMENSIONALLY-STABLE POLYURETHANE SPONGE AND SPONGE-FORMING PREPOLYMER

James L. Guthrie, Ashton, and Suze E. Arquette, Columbia, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 220,562, Dec. 29, 1980. This application Oct. 26, 1981, Ser. No. 314,537

Int. Cl.³ C08G *18/14, 18/48, 18/79*

U.S. Cl. 521—137 **16 Claims**

1. A foamed sponge having minimal swell when wet and which does not curl upon drying made by mixing together and reacting an aqueous phase and

a resin phase comprising a prepolymer derived from

(a) a poly(oxy C_{2-4} alkylene) diol having at least about 50% by weight of oxyethylene groups and a nominal number average molecular weight of about at most 1100, said diol having nominally two hydroxyl equivalents per mole,

(b) a diphenylmethane diisocyanate-containing isocyanate product with a functionality of greater than 2.0 comprising a mixture of a major amount of pure diphenylmethane diisocyanate and minor amounts of carbodiimides and trifunctional cycloadducts of diphenylmethane diisocyanate, and

(c) a monomeric polyol cross-linking agent having 3 or 4 hydroxyl equivalents per mole,

said isocyanate product comprising more than 50% by weight of the prepolymer,

said diol and polyol cross-linking agent being present in a mole ratio in the range of 4:1 to 8:1, and

the ratio of the isocyanate equivalents to the total hydroxyl equivalents being in the range of 3:1 to 4:1.

4,377,646

PROCESS FOR THE PRODUCTION OF FOAMED POLY(EPOXY-POLYISOCYANATE)SILICATE POLYMERS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 326,842, Dec. 3, 1981, Pat. No. 4,357,463, which is a continuation-in-part of Ser. No. 122,015, Feb. 19, 1980, which is a continuation-in-part of Ser. No. 10,061, Feb. 7, 1979, Pat. No. 4,200,697, which is a continuation-in-part of Ser. No. 794,915, May 9, 1977, Pat. No. 4,125,498, which is a continuation-in-part of Ser. No. 653,727, Jan. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 562,201, Apr. 14, 1975, abandoned. This application Aug. 5, 1982, Ser. No. 405,414

Int. Cl.³ C08G *63/00*

U.S. Cl. 521—154 **20 Claims**

1. The process for the production of foamed poly(epoxide-polyisocyanate-silicate) product by mixing and reacting the following components:

(a) an organic mono-or polyepoxide compound, 1 to 200 parts by weight;

(b) an organic compound containing at least 2 isocyanate groups, 50 to 100 parts by weight;

(c) a Lewis acid, up to 20% by weight, percentage based on weight of components (a) and (b);

(d) an oxidated silicon compound, 1 to 50 parts by weight.

4,377,647

POLYMER BLEND COMPOSITION

Daniel P. Durbin, Houston; Richard L. Danforth, Missouri City, and Robert G. Lutz, Spring, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 16, 1981, Ser. No. 321,647

Int. Cl.³ C08K *5/01*; C08F *293/00*; C08L *67/00*

U.S. Cl. 523—518 **9 Claims**

1. A thermoplastic molding composition comprising:

(a) from about 10 to about 85 percent by weight of a selectively hydrogenated block copolymer comprising at least two monoalkenyl arene polymer end blocks A and at least one substantially completely hydrogenated conjugated diene polymer mid block B, the weight percent of blocks A comprising between 8 and 65 percent by weight of said block copolymer wherein at least 80% of the aliphatic double bonds in block B are hydrogenated and no more than about 25% of the alkenyl aromatic double bonds in blocks A are hydrogenated;

(b) from about 10 to about 80 percent by weight of a vinyl aromatic copolymer comprising a vinyl aromatic compound and an α,β-unsaturated cyclic anhydride; and

(c) from about 10 to about 80 percent by weight of a thermoplastic polyester having a molecular weight in excess of about 20,000, a melting point over about 120° C., and which polyester is selected from the group consisting of a condensation product of a dicarboxylic acid and a glycol, polypivalolactone and polycaprolactone.

4,377,648

CELLULOSE-POLYACRYLONITRILE-DMSO-FORMALDEHYDE SOLUTIONS, ARTICLES, AND METHODS OF MAKING SAME

Jacques Menault, Charbonnieres-Les-Bains, and Henry Rodier, Sainte-Foy-Les-Lyon, both of France, assignors to Rhone-Poulenc-Textile, Paris, France

Filed May 6, 1980, Ser. No. 147,221

Claims priority, application France, May 14, 1979, 79 12383; Mar. 13, 1980, 80 05963

Int. Cl.³ C08L *1/02*; D01D *5/06*; D01F *6/18*

U.S. Cl. 524—35 **7 Claims**

1. Shapable polymeric solution, said solution consisting essentially of (a) cellulose having a degree of polymerisation of at least 200, (b) an acrylonitrile polymer, (c) dimethylsulfoxide and (d) formaldehyde,

the weight ratio of cellulose/acrylonitrile polymer being between 0.1 and 1,

the weight ratio of formaldehyde/cellulose being between 0.2 and 2,

and the total polymer concentration in the solution being between 18 and 30% by weight.

5. Process for the preparation of shapable solutions, said process comprising adding an acrylonitrile polymer powder to cellulose in a mixture of dimethylsulfoxide and formaldehyde, said cellulose having a degree of polymerisation of at least 200 and being previously dried, the weight ratio of cellulose/acrylonitrile polymer being between 0.1 and 1.

4,377,649

WAX COMPOSITIONS

Nevin J. Sweeney, St. Clair, and Kenneth C. Seale, Dural, both of Australia, assignors to K. H. Freeman Pty. Ltd., Australia

Filed Jul. 22, 1981, Ser. No. 286,023

Claims priority, application Australia, Jul. 22, 1980, PE4632

Int. Cl.³ C08L *3/02*

U.S. Cl. 524—49 **6 Claims**

1. A composition for use in the manufacture of cellulosic fibre materials, which comprises

(a) from 1 to 50 wt % of a wax,

(b) from 1 to 30 wt % of a starch,

(c) from 1 to 50 wt % of a formaldehyde based resin, and

(d) a liquid carrier.

4,377,650

PROCESS FOR THE PREPARATION OF COLORED POWDERS OF HYDROLYZED ETHYLENE-VINYL ACETATE COPOLYMER

Joseph Fischer, Cincinnati, Ohio, assignor to National Distillers & Chemical Corp., New York, N.Y.

Filed Oct. 31, 1980, Ser. No. 202,559
Int. Cl.³ C08J 3/20; C08K 3/22, 5/08, 5/34
U.S. Cl. 524—88 9 Claims

1. A process for the preparation of colored particles of hydrolyzed ethylene-vinyl acetate copolymer in the absence of intensive mixing methods which comprises hydrolyzing ethylene-vinyl acetate copolymer in solution in the presence of coloring agent, said coloring agent being present in the ethylene-vinyl acetate copolymer prior to hydrolysis of the latter, and thereafter recovering the hydrolyzed ethylene-vinyl acetate copolymer in the form of particles having coloring agent finely dispersed therein.

4,377,651

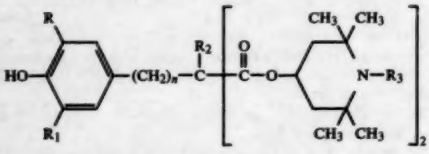
POLYOLEFIN STABILIZATION

James C. Leininger, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 82,391, Oct. 5, 1979, abandoned. This application Apr. 16, 1981, Ser. No. 254,680
Int. Cl.³ C08K 5/34
U.S. Cl. 524—101 20 Claims

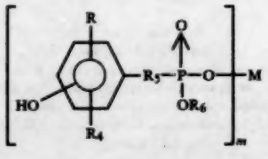
1. A stabilized polymeric composition comprising a major amount of a polymer of a mono-1-olefin having incorporated therein a small, but effective, stabilizing amount, sufficient to stabilize said composition against the deteriorative action of oxygen, heat and ultraviolet light, of

(a) at least one hindered amine represented by the formula



where R, R_1, R_2 are the same or different and each is an alkyl group having from 1 to 6 carbon atoms such as methyl, n-propyl, n-butyl, t-butyl, t-pentyl, t-hexyl, R_3 is an alkyl group having from 1 to 12 carbon atoms, and n is an integer of 1 to 4 and

(b) at least one metal phosphonate represented by the formula



where R is as before, R_4 is hydrogen or alkyl having from 1 to 6 carbon atoms, R_5 is an alkylene radical having from 1 to 4 carbon atoms, R_6 is hydrogen or alkyl having from 1 to 30 carbon atoms, M is a metal selected from among aluminum, barium, cadmium, calcium, chromium, cobalt, nickel, sodium, tin, and zinc and m is 1, 2 or 3.

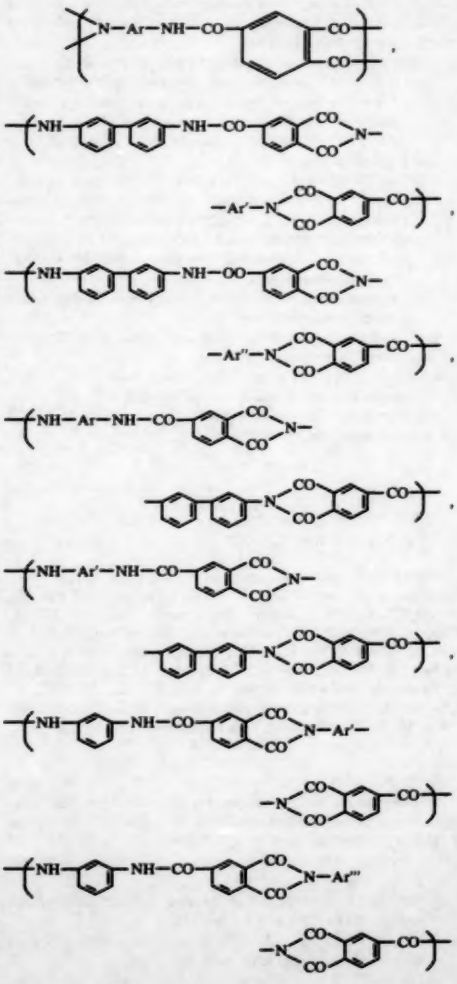
4,377,652

POLYAMIDE-IMIDE COMPOSITIONS AND ARTICLES FOR ELECTRICAL USE PREPARED THEREFROM

Kaoru Ohmura; Ichiro Shibasaki, and Takeo Kimura, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 8, 1979, Ser. No. 10,290
Claims priority, application Japan, Feb. 17, 1978, 53-16612; Apr. 28, 1978, 53-51214; May 25, 1978, 53-61637; May 25, 1978, 53-62604; May 25, 1978, 53-62605; Jul. 21, 1978, 53-88363; Jul. 21, 1978, 53-88364; Jul. 21, 1978, 53-88365; Jul. 21, 1978, 53-88367; Jul. 24, 1978, 53-89391; Jul. 24, 1978, 53-89392; Jul. 27, 1978, 53-89393; Jul. 27, 1978, 53-90933; Jul. 27, 1978, 53-90934
Int. Cl.³ C08G 73/14; C08L 79/08
U.S. Cl. 524—104 26 Claims

1. An article for electrical use, comprising (a) an aromatic polyamide-imide having a reduced viscosity of from about 0.3 to 1.5 and repeating units for the formula,



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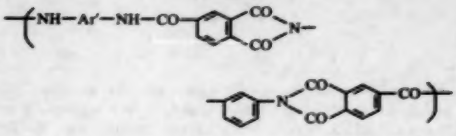
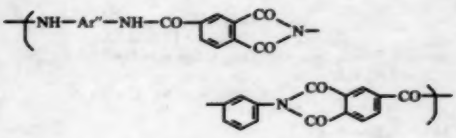
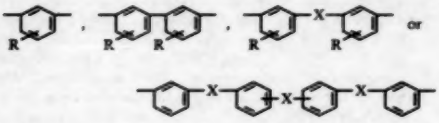


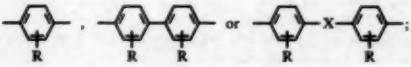
or



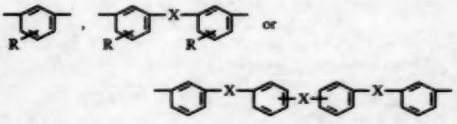
wherein Ar is a divalent residue represented by the formula,



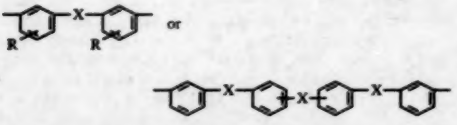
Ar' is a divalent residue represented by the formula,



Ar'' is a divalent residue represented by the formula,



and Ar''' is a divalent residue represented by the formula,



wherein R moieties may be the same or different and represent a hydrogen atom, a halogen atom or an alkyl group having 1 to 4 carbon atoms; X is an oxygen atom, a sulfur atom, a sulfonyl group, a carbonyl group, a carbonyloxy group, a methylene group, an ethylene group or a dimethylmethylene group; and (b) about 1 to 40 times the weight of (a) of at least one granular material uniformly dispersed therein selected from the group consisting of metals, metal oxides, metal nitrides, metal carbides, metal silicides, silicon, silicon oxides, silicon nitrides, silicon carbide, boron, boron nitrides and carbon.

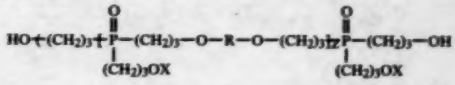
4,377,653

MIXED ETHER COMPOSITIONS CONTAINING OLIGOMERS OF POLYFUNCTIONAL PHOSPHINE OXIDES: FLAME RETARDANTS FOR POLYMERS

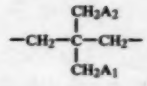
Edward R. Fretz, Jr., East Windsor, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Jan. 30, 1981, Ser. No. 229,706
Int. Cl.³ C08K 5/53; C07F 9/53
U.S. Cl. 524—129 **73 Claims**

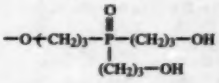
1. Mixed ether compositions containing oligomers having the structure:



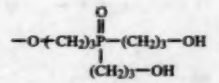
wherein R is an organic residue derived from a polyhydric alcohol, said R being a divalent radical selected from the class consisting of a hydrocarbon radical, a halogenated hydrocarbon radical and



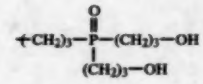
wherein A_1 and A_2 are radicals selected from the group consisting of hydroxyl, hydrogen, bromine and



radicals provided that when A_1 is

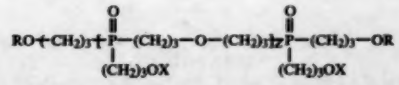


A_2 is hydroxyl; when A_1 is hydroxyl A_2 is hydroxyl; when A_1 is hydrogen A_2 is hydrogen; and when A_1 is bromine A_2 is bromine, Z is 1, 2 or 3, and X may be the same or a different radical selected from the group consisting of hydrogen and

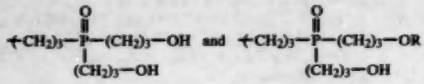


radicals.

19. Mixed ether compositions containing oligomers having the structure:

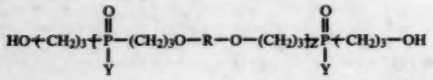


wherein Z is 1, 2 or 3, R is the same or a different radical selected from the group consisting of hydrogen, aliphatic alkoxyaliphatic, cycloaliphatic, aromatic, halogenated aliphatic, halogenated cycloaliphatic and halogenated aromatic radicals and X may be the same or a different radical selected from the group consisting of hydrogen, R,

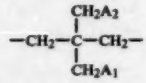


radicals.

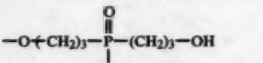
38. Mixed ether compositions containing oligomers having the structure:



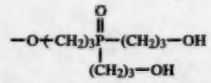
wherein R is an organic residue derived from a polyhydric alcohol, said R being a divalent radical selected from the class consisting of a hydrocarbon radical, a halogenated hydrocarbon radical and



wherein A_1 and A_2 are radicals selected from the group consisting of hydroxyl, hydrogen, bromine and

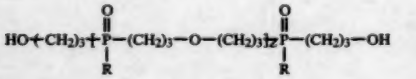


radicals provided that when A_1 is



A_2 is hydroxyl; when A_1 is hydroxyl A_2 is hydroxyl; when A_1 is hydrogen A_2 is hydrogen; and when A_1 is bromine A_2 is bromine, Z is 1, 2 or 3, and Y is a radical selected from the group consisting of aliphatic and cycloaliphatic radicals.

60. Mixed ether compositions containing oligomers having the structure:



wherein R is a radical selected from the group consisting of aliphatic and cycloaliphatic radicals and Z is 1, 2 or 3.

4,377,654

POLYMERIZATION PROCESSES AND POLYMER COMPOSITIONS

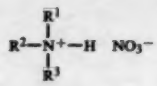
Howard C. Haas, Arlington, Mass., and Robert D. Moreau, Nashua, N.H., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 16, 1981, Ser. No. 322,065

Int. Cl.³ C08K 5/17; C08F 2/06; C09D 3/04; C08L 89/00

U.S. Cl. 524—236 23 Claims

1. A composition comprising a polymer dissolved in an alkyl ammonium nitrate fused salt of the formula



wherein R^1 is a substituted or unsubstituted alkyl group and R^2 and R^3 are each independently hydrogen or a substituted or unsubstituted alkyl group, said alkyl ammonium nitrate having a melting point of up to about 125° C.

4,377,655

DULL, SMOOTH UNIT SOLES

Glenn R. Himes, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 14, 1981, Ser. No. 330,736

Int. Cl.³ C08K 3/22, 5/01, 5/10

U.S. Cl. 524—313 8 Claims

1. A non-delaminating polymeric composition having a smooth, dull appearance in molded unit soles, said composition comprising:

(a) 100 parts by weight of a mixture of a linear ABA block copolymer and a radial $(AB-)_xBA$ block copolymer where χ is greater than 1, the weight ratio of linear to radial block copolymer is between about 25/75 and about 90/10, each block A being a monoalkenyl arene polymer having an average molecular weight between about 5,000 and 45,000, each block B being an elastomeric conjugated diene polymer having an average molecular weight between about 15,000 and about 300,000, and said blocks A comprise 8–75% by weight of each copolymer;

(b) about 5 to about 50 parts by weight of a styrene-acrylonitrile copolymer;

(c) about 3 to about 30 parts by weight of a vulcanized vegetable oil;

(d) about 0 to about 200 parts by weight of a hydrocarbon rubber extending oil; and

(e) about 0 to about 250 parts by weight of a finely divided filler.

4,377,656

COATING COMPOSITIONS COMPRISING ALLYLIC ALCOHOL INTERPOLYMERS

Irving Serlin, and Donald M. Gardner, both of Springfield, Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed May 22, 1981, Ser. No. 266,543

Int. Cl.³ C08K 3/26, 3/10; C08L 25/06; B32B 5/16

U.S. Cl. 524—413 15 Claims

1. A coating composition comprising an intimate blend of a polymeric binder and from 200 to 1000 parts by weight of a finely divided non-photoconductive pigment per 100 parts by weight of the polymeric binder; wherein the polymeric binder comprises a major proportion of a low molecular weight interpolymer and a minor proportion of a high molecular weight interpolymer; wherein the low molecular weight interpolymer comprises from about 40 to about 85 parts by weight of monovinyl aromatic monomer units and from about 15 to about 60 parts by weight of units of a C_3–C_7 allylic alcohol and of a C_3–C_7 allylic alcohol ester of a mono-carboxylic acid, the mol ratio of monovinyl aromatic units to allylic alcohol and allylic ester units being about 3:1 or less, the mol ratio of allylic ester units to allylic alcohol units being in the range of 0 to about 10, the number average molecular weight of the interpolymer being in the range of about 700 to about 5000 and the glass temperature of the interpolymer being at least about 30° C.; wherein the high molecular weight interpolymer has a number average molecular weight in the range of about 5,000 to about 100,000; and wherein the weight ratio of low molecular weight interpolymer to high molecular weight interpolymer is in the range of about 99:1 to about 70:30 and the solids content of the

coating composition is in the range of about 40 to about 90 weight percent.

4,377,657

BIS-MALEIMIDE RESIN/DIVINYL ARYLENE COMPOSITES

Sidney W. Street, Hacienda Heights, and Don A. Beckley, Newport Beach, both of Calif., assignors to HITCO, Irvine, Calif.

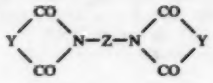
Division of Ser. No. 134,666, Mar. 27, 1980. This application Mar. 30, 1981, Ser. No. 248,978

Int. Cl.³ C08L 39/00

U.S. Cl. 524—424 **17 Claims**

1. A composite comprising 20 to 50% by weight of a resin system consisting essentially of:

50 to 95% by weight of a mixture of unsaturated N,N'-bis-imides of the formula:



where Y represents a divalent radical of at least 2 carbon atoms and contains a carbon-carbon double bond and in the major portion of the mixture, Z is the residue of at least one aromatic diamine and in the minor portion of the mixture Z is the residue of an aliphatic diamine;

5 to 35% by weight of a divinyl-arylene, cross-linking agent capable of addition polymerization cross-linking with the bis-imides at a temperature from above 100° F. to 250° F.;

0 to 15% by weight of compatible elastomers that are compatible with the bis-imide and cross-linking agent;

0 to 10% by weight of a trifunctional unsaturated curing agent for said bis-imide;

0 to 5% by weight of an oxidation inhibitor; and

the remainder of the composite being fiber reinforcement.

4,377,658

SOLVENT RESISTANT POLYMERIC COMPOSITION

James H. Collins, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 22, 1982, Ser. No. 341,963

Int. Cl.³ A43B 13/04; C08K 3/26, 3/36; C08L 53/02

U.S. Cl. 524—425 **7 Claims**

1. A polymeric composition having improved resistance to environmental flex cracking solvent attack, abrasion and ozone attack consisting essentially of:

(a) 100 parts by weight of a block copolymer component selected from the group consisting of:

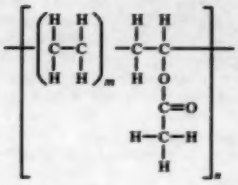
(i) a mixture of a radial $(A\ B)_x$ BA first block copolymer and a radial $(A'\ B')_y B'A'$ second block copolymer where x and y are greater than 1, the weight ratio of first block copolymer to second block copolymer is between about 20:80 and about 90:10, each block A being a monoalkenyl arene polymer block having a number average molecular weight between about 20,000 and about 40,000, each block B being an elastomeric conjugated diene polymer block having a number average molecular weight between about 15,000 and about 300,000, the blocks A comprising about 40 to about 55 percent by weight of said first block copolymer, each block A' being a monoalkenyl arene polymer having a number average molecular weight between about 5,000 and about 30,000, each block B' being an elastomeric conjugated diene polymer block having a number average molecular weight between about 15,000 and about 300,000, the blocks A' comprising about 20 to 40 percent by weight of said second block copolymer;

(ii) a radial $(CD)_z D$ C third block copolymer where z is greater than 1, each block C being a monoalkenyl arene polymer block having a number average molecular weight between about 15,000 and about 25,000, each block D being an elastomeric conjugated diene polymer block having a number average molecular weight between about 15,000 and about 300,000, the blocks C comprising between about 35 and about 45 percent by weight of said third block copolymer; and

(iii) mixtures of (i) and (ii);

(b) about 5 to about 50 parts by weight of a high density polyethylene having a melt flow index at 190° C. between about 0.1 and about 30 and a specific gravity above 0.94;

(c) about 20 to about 100 parts by weight of an ethylene-vinyl acetate copolymer having a melt flow index at 190° C. between about 0.1 and about 8 and a general formula



where n ranges from about 15 to about 250 and m ranges from about 6.5 to about 40;

(d) about 25 to about 160 parts by weight of a hydrocarbn rubber extending oil;

(e) about 5 to about 30 parts by weight of a polystyrene resin selected from the group consisting of crystal polystyrene, high impact polystyrene, medium impact polystyrene and poly(alpha-methylstyrene); and

(f) about 10 to about 60 parts by weight of a finely divided filler.

7. A shoe sole having the composition of claim 1.

4,377,659

PROCESS FOR THE PRODUCTION OF POLYESTER SILICATE RESINOUS PRODUCTS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Division of Ser. No. 256,317, Apr. 22, 1981, which is a continuation-in-part of Ser. No. 122,015, Feb. 19, 1980, which is a continuation-in-part of Ser. No. 10,061, Feb. 7, 1979, which is a continuation-in-part of Ser. No. 794,915, May 9, 1977, Pat. No. 4,125,498, which is a continuation-in-part of Ser. No. 653,727, Jan. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 562,201, Apr. 14, 1975, abandoned. This application Sep. 1, 1982, Ser. No. 413,974

Int. Cl.³ C08K 5/00

U.S. Cl. 524—457 **20 Claims**

1. Process for the production of polyester silicate resinous product by the following steps:

(a) mixing and reacting the following components, thereby producing a polyester silicate resinous product;

(i) an alkali metal silicate, 1 to 10 parts by weight;

(ii) an organic monohydroxy compound having a substituent which will split off during the reaction, 10 to 30 parts by weight;

(iii) a polycarboxylic acid, polycarboxylic acid anhydride and mixtures thereof, 10 to 30 parts by weight;

(b) Admixing and reacting a vinyl monomer in an amount of 20 to 50 percent by weight, percentage based on the weight of the polyester silicate resinous product of step (a), and a catalytic amount of a peroxide initiator and activator,

(c) thereby producing a polyester silicate resinous product.

4,377,660

MOLDED POLYMER TREATMENT

Van C. Vives, and Donnie G. Brady, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 13, 1981, Ser. No. 310,716
Int. Cl.³ C08K 3/40
U.S. Cl. 524—494 9 Claims

1. A process for improving the physical and chemical properties of arylene sulfide polymers which comprises

(a) contacting a surface of a molded form of said polymer with an alkali metal or alkaline earth metal hypohalite and

(b) subjecting the polymer of (a) to heat treatment at a temperature below the melting point of the polymer in plural stages of increasing temperatures with the initial stage being carried out at about 475° F. and heating at each stage being maintained for a period of time sufficient to improve the flexural and tensile properties of the molded polymer and extend the limits of its usage to higher temperatures.

5. A process according to claim 1 wherein said arylene sulfide polymer is fiberglass-filled poly(phenylene sulfide).

4,377,661

ACRYLIC RESIN-ACRYLIC MICROGEL COMPOSITIONS

Howard J. Wright, Kansas City, Mo.; David P. Leonard, Overland Park, Kans., and Roger A. Etzell, Gladstone, Mo., assignors to Cook Paint and Varnish Company, Kansas City, Mo.

Division of Ser. No. 98,115, Nov. 27, 1979, Pat. No. 4,290,932. This application Apr. 23, 1981, Ser. No. 256,959
Int. Cl.³ C08L 33/02, 33/14
U.S. Cl. 524—522 8 Claims

1. In a paint containing an acrylic microgel resin to improve pigment orientation and sag resistance thereof comprising said resin being made by preparing an aqueous microgel emulsion by the emulsion polymerization in water of a mixture of ethylenically unsaturated monomers, at least one of said monomers being an acrylic or methacrylic acid, or an —OH substituted alkyl ester thereof, and containing a —COOH or —OH group, and at least another of said monomers being selected from an alkyl ester of an acrylic or methacrylic acid, styrene and alpha-methyl styrene, and being free from —COOH and —OH groups, and a multifunctional crosslinking agent present in an amount of 5–70 percent by weight of the total weight of said ethylenically unsaturated monomers and crosslinking agent, removing water from the emulsion by coagulation and/or azeotropic distillation with an organic solvent in which the microgel is insoluble and which forms an azeotrope with water, and incorporating the microgel into an acrylic resin prepared by polymerizing two or more ethylenically unsaturated monomers in an organic solvent solution wherein at least one of said monomers is an —OH substituted alkyl ester of an acrylic or methacrylic acid and optionally a monomer containing a —COOH group selected from an acrylic or methacrylic acid, and another of said monomers being selected from an alkyl ester of an acrylic or methacrylic acid, styrene and alpha-methyl styrene, and being free from —COOH and —OH groups to provide said acrylic microgel resin wherein the amount of microgel solids is in the range of 5 to 15 percent by weight of the total resin solids.

4,377,662

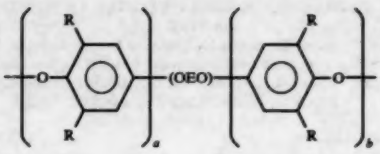
BLOCK COPOLYMERS OF POLYPHENYLENE OXIDES AND STERICALLY-HINDERED AROMATIC POLYCARBONATES

George R. Loucks, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 2, 1981, Ser. No. 250,511
Int. Cl.³ C08L 71/04, 69/00
U.S. Cl. 525—394 3 Claims

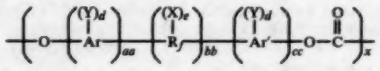
1. A block copolymer of a polyphenylene oxide and a sterically hindered aromatic polycarbonate consisting of chemically combined

(i) polyphenylene oxide blocks of the formula,



wherein —(OEO)— is a divalent quinone residue, E is a divalent arene radical, either a or b is a number at least equal to 1 and the sum of a plus b is at least equal to 10, R is a member selected from hydrogen, a hydrocarbon radical, a halohydrocarbon radical, a hydrocarbonoxy radical or a halohydrocarbonoxy radical,

(ii) sterically hindered aromatic polycarbonate blocks of the formula,



wherein R_f is a member selected from an alkylene, alkylidene, cycloalkylene, cycloalkylidene, arylene linkage and a mixture thereof, a linkage selected from the group consisting of ether, carbonyl, amine, a sulfur or phosphorus containing linkage, Ar and Ar' are arene radicals, Y is bromine, chlorine or a monovalent alkyl or alkoxy group, d represents a whole number up to a maximum equivalent to the number of replaceable hydrogens substituted on the aromatic rings comprising Ar or Ar', subject to the proviso that at least two Y groups are ortho-positioned relative to each —OH group of each arene radical, X is bromine, chlorine or a monovalent hydrocarbon group selected from the class consisting of alkyl, aryl and cycloalkyl including mixtures thereof, e represents a whole number of from 0 to a maximum controlled by the number of replaceable hydrogens on R_f, aa, bb and cc represent whole numbers including 0, when bb is not zero, neither aa nor cc may be zero, otherwise either aa or cc but not both may be 0, when bb is zero, the aromatic groups can be joined by a direct carbon bond, x is a number at least equal to 30, and

(iii) carbonyl radicals of the formula

4,377,663

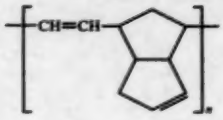
COMPOSITION

Hiroshi Wakabayashi, Kobe, Japan, assignor to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 24, 1981, Ser. No. 305,326
Claims priority, application Japan, Oct. 3, 1980, 55-139085
Int. Cl.³ C09D 3/66, 3/58, 3/74, 5/02
U.S. Cl. 525—64 9 Claims

1. A composition comprising a homogeneous mixture of

(a) a vinyl polymer obtained by polymerizing a vinyl monomer or monomers in the presence of a neutralized, water soluble product of an adduct between a substantially amorphous polymer obtained by ring opening polymerization of dicyclopentadiene represented by the following chemical structural formula:



and maleic acid or maleic anhydride; and

(b) an oxidation-curable water soluble resin, with a proportion of (a) to (b) being within the range of 5:95 to 95:5, in terms of solid content.

4,377,664

THERMOPLASTIC MOLDING COMPOSITION COMPRISING A METHYL METHACRYLATE POLYMER AND STYRENE-CITRACONIC ANHYDRIDE COPOLYMER

Larry G. Bourland, Downingtown, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 12, 1981, Ser. No. 320,400

Int. Cl.³ C08L *33/12, 25/14, 25/08*

U.S. Cl. 525—94 **6 Claims**

1. A thermoplastic molding composition comprising a mixture of two at least partially miscible thermoplastic synthetic polymers, one polymer being styrene-citraconic anhydride copolymer and the other polymer being selected from the group consisting of polymethylmethacrylate and methylmethacrylate-styrene copolymer in which said styrene-citraconic anhydride copolymer contains less than about 50 weight percent citraconic anhydride.

4,377,665

PROCESS FOR PRODUCING BLOCK COPOLYMER RESIN

Toshinori Shiraki, Yamato, Japan; Akio Yamori, Victoria, Australia, and Hideo Morita, Yokohama, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 29, 1981, Ser. No. 316,420

Claims priority, application Japan, Nov. 12, 1980, 55-159348

Int. Cl.³ C08F *297/04*

U.S. Cl. 525—250 **18 Claims**

1. A process for producing a block copolymer resin comprising at least one vinyl aromatic hydrocarbon polymer block and at least one polymer block primarily composed of a conjugated diene, the weight ratio of vinyl aromatic hydrocarbon to conjugated diene being 55:45 to 95:5, using an organolithium compound as a catalyst in a solvent composed principally of an aliphatic hydrocarbon, wherein the improvement comprises adding continuously a monomer of a vinyl aromatic hydrocarbon to be added for formation of the vinyl aromatic hydrocarbon polymer block, at a stage of polymerization at which the vinyl aromatic hydrocarbon content in the polymer formed has reached 55% by weight or more, at a rate which is higher than the substantial average polymerization rate of said monomer at the polymerization temperature and yet maintains the solubility parameter of the liquid phase portion in the polymerization system at substantially not higher than 7.7 to further continue polymerization.

4,377,666

AGE-RESISTANT POLYMERS CONTAINING CHEMICALLY BOUND ANTIOXIDANT FUNCTIONAL GROUPS

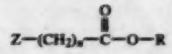
Ralph C. Farrar, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 17, 1981, Ser. No. 293,737

Int. Cl.³ C08F *8/00, 8/32*

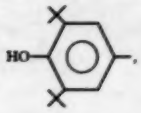
U.S. Cl. 525—132 **25 Claims**

14. An age-resistant polymer produced by the process of treating a living alkali metal-terminated polymer selected from conjugated diene homopolymers, copolymers, or copolymers of a conjugated diene with a comonomer containing a vinylidene group, which comprises contacting said living alkali metal-terminated conjugated diene polymer with an effective coupling amount of

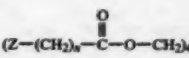


I

wherein Z is the 3,5-di-tert-butyl-4-hydroxyphenyl moiety

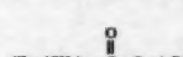


n is 0–4, and R is an alkyl radical of 1–24 carbon atoms;



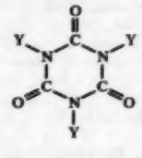
II

wherein Z and n are as defined above;



III

wherein Z and n are as defined above and R′ is an alkylene radical of 2–10 carbon atoms; and



IV

wherein Y is Z—$(CH_2)_n$—, and Z and n are as defined above, and mixtures, thereby resulting in a coupled conjugated diene polymer of increased molecular weight exhibiting aging stability.

4,377,667

POLYACETAL AND PROCESS OF PRODUCING SAME

Hisaya Sakurai; Minoru Hamada, and Kazuhiko Matsuzaki, all of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

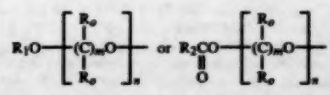
Filed Jan. 4, 1981, Ser. No. 270,555

Claims priority, application Japan, Jan. 13, 1980, 55-79671; Jan. 25, 1980, 55-86344; Jul. 31, 1980, 55-104387; Aug. 6, 1980, 55-107096

Int. Cl.³ C08F *4/34;* **C08G** *6/00*

U.S. Cl. 525—400 **21 Claims**

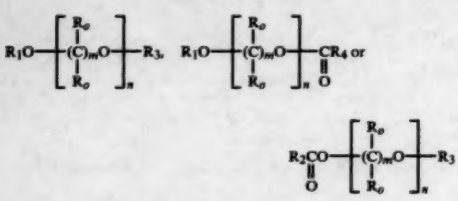
1. A polyacetal having at least one terminal of its linear polymer molecule capped with an alkylene oxide adduct of an alcohol or a carboxylic acid, which adduct is represented by the general formula



wherein R_0 is a hydrogen atom, alkyl group, substituted alkyl

group, aryl group, or substituted aryl group, R_0's may be the same or different, R_1 is an alkyl group, substituted alkyl group, aryl group, or substituted aryl group, R_2 is a hydrogen atom, alkyl group, substituted alkyl group, aryl group, or substituted aryl group, m is from 2 to 6, and n is from 1 to 1,000; said polyacetal having a number average molecular weight ranging from 10,000 to 500,000 excluding the terminal group.

15. A process for producing a polyacetal, which comprises homopolymerizing formaldehyde or trioxane in the presence of a compound selected from the group of compounds represented by the general formula



wherein R_0 is a hydrogen atom, alkyl group, substituted alkyl group, aryl group, or substituted aryl group, R_0's may be the same or different, R_1 is an alkyl group, substituted alkyl group, aryl group, or substituted aryl group, R_2 is a hydrogen atom, alkyl group, substituted alkyl group, aryl group, or substituted aryl group, R_3 is a hydrogen atom, alkyl group, substituted alkyl group, aryl group, or substituted aryl group, and R_4 is a hydrogen atom, alkyl group, substituted alkyl group, aryl group, or substituted aryl group, m is from 2 to 6, and n is from 1 to 1,000.

4,377,668

PHOTO-CROSSLINKABLE POLYAMIDE WITH SIDE TRICYCLIC IMIDYL GROUPS

Hans Zweifel, Basel, and Daniel Bellus, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

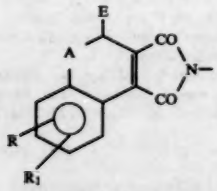
Division of Ser. No. 9,984, Feb. 6, 1979, Pat. No. 4,283,509. This application Mar. 6, 1981, Ser. No. 241,169

Claims priority, application Switzerland, Feb. 8, 1978, 1401/78

Int. Cl.³ C08G 69/48

U.S. Cl. 525—426 **5 Claims**

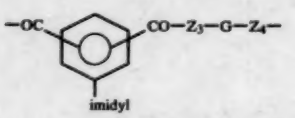
1. A photo-crosslinkable polymer, which has an average molecular weight between 1,000 and 50,000, as measured by inherent viscosity on a 0.5% by weight solution in chloroform at 20° C., and which has side imidyl groups of the formula (I)



(I)

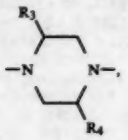
in which R and R_1 independently of one another are hydrogen, halogen, alkyl having 1–4 C atoms or methoxy, A is $—CH_2—$, $—CH_2CH_2—$ or $—OCH_2—$ with the oxygen atom bonded to the aromatic ring and E is hydrogen, or A is —O— and E is $—CH_3$, the proportion of imidyl groups of the formula I being at least 5 percent, based on the number of recurring structural elements in the polymer, said polymer being a polyamide which is a homopolycondensation product or a copolycondensation product of a dicarboxylic acid or amide forming derivative thereof with a diamine, wherein said polymer comprises

(a) from 5 to 100 percent, based on recurring structural elements in the polymer chain, of molecular chain members of the formula XV



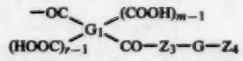
(XV)

in which Z_3 and Z_4 are —NH—, and G is an aliphatic radical having at least 2 C atoms or a cycloaliphatic, araliphatic, carbocyclicaromatic or heterocyclic-aromatic radical, or $Z_3—G—Z_4—$ is a grouping of the formula



and R_3 and R_4 independently of one another are hydrogen, methyl or phenyl, the two carbonyl groups in the formula XV being bonded to the benzene ring in the meta- or paraposition relative to one another, and

(b) from 95 to 0 percent, based on recurring structural elements in the polymer chain, of structural elements of the formula XVII



(XVII)

in which Z_3, Z_4 and G are as defined under formula XV, m and r are each the number 1, and G_1 is an aliphatic radical having at least 2 C atoms or a cycloaliphatic, araliphatic, carbocyclic-aromatic or heterocyclic-aromatic radical.

4,377,669

PHOTOCROSSLINKABLE POLYESTER WITH SIDE TRICYCLIC IMIDYL GROUPS

Hans Zweifel, Basel, and Daniel Bellus, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

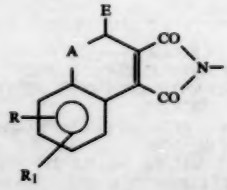
Division of Ser. No. 9,984, Feb. 6, 1979, Pat. No. 4,283,509. This application Mar. 6, 1981, Ser. No. 241,194

Claims priority, application Switzerland, Feb. 8, 1978, 1401/78

Int. Cl.³ C08G 63/46

U.S. Cl. 525—445 **5 Claims**

1. A photo-crosslinkable polymer, which has an average molecular weight between 1,000 and 50,000, as measured by inherent viscosity on a 0.5% by weight solution in cyclohexanone at 20° C. and which has side imidyl groups of the formula (I)

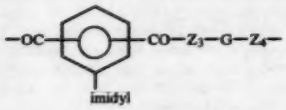


(I)

in which R and R_1 independently of one another are hydrogen, halogen, alkyl having 1–4 C atoms or methoxy, A is $—CH_2—$,

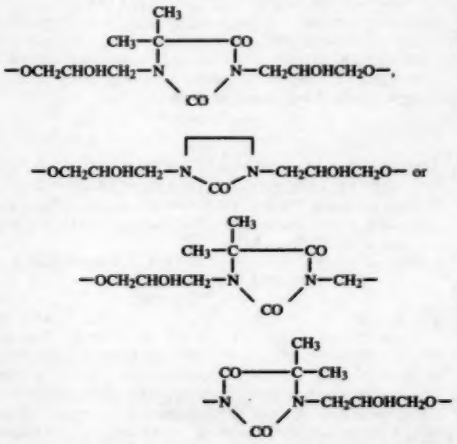
—CH_2CH_2— or —OCH_2— with the oxygen atom bonded to the aromatic ring and E is hydrogen, or A is —O— and E is —CH_3, the proportion of imidyl groups of the formula I being at least 5 percent, based on the number of recurring structural elements in the polymer, said polymer being a polyester which is a homopolycondensation product or a copolycondensation product of a dicarboxylic acid or ester forming derivative thereof with a dihydroxy or diglycidyl compound, wherein said polymer comprises

(a) from 5 to 100 percent, based on recurring structural elements in the polymer chain, of molecular chain members of the formula XV



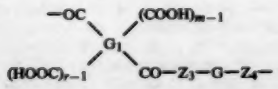
(XV)

in which Z_3 and Z_4 are —O—, and G is an aliphatic radical having at least 2 C atoms or a cycloaliphatic, araliphatic, carbocyclicaromatic or heterocyclic-aromatic radical, or Z_3—G—Z_4— is a grouping of the formulae



the two carbonyl groups in the formula XV being bonded to the benzene ring in the meta- or para-position relative to one another, and

(b) from 95 to 0 percent, based on recurring structural elements in the polymer chain, of structural elements of the formula XVII



(XVII)

in which Z_3, Z_4 and G are as defined under formula XV, m and r are each the number 1, and G_1 is an aliphatic radical having at least 2 C atoms or a cycloaliphatic, araliphatic, carbocyclic-aromatic or heterocyclic-aromatic radical.

4,377,670

COPOLYMERS BASED ON ALIPHATIC POLYCARBONATES AND LACTAMS

Heinrich Krimm; Hans-Josef Buysch, and Artur Botta, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 23, 1981, Ser. No. 314,242

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1980, 3040613

Int. Cl.³ C08G 63/62, 69/16

U.S. Cl. 525—467 **5 Claims**

1. A process for the production of a copolymer having weight average molecular weights between 1,000 and 150,000 determined by light scattering measurement and containing urethane and carboxylic acid ester groups, which comprises heating at a temperature from 100° to 250° C. an anhydrous mixture of a lactam and an aliphatic polycarbonate having a molecular weight in the range from 1,000 to 500,000 determined by light scattering measurements in the presence of an alkaline catalyst in amounts from 0.001 to 1% by weight based on the weight of the reactants which mixtures have from 20 to 80% by weight of lactam and from 80 to 20% by weight of said polycarbonate.

4,377,671

PROCESS FOR PRODUCING OLEFINIC COPOLYMER RUBBERS

Kenya Makino, Kuwana; Hideo Sakurai; Masaru Watanabe, both of Yokkaichi, and Toshiyuki Nishimura, Kameyama, all of Japan, assignors to Japan EP Rubber Co., Ltd., Mie, Japan

Continuation of Ser. No. 194,274, Oct. 6, 1980, abandoned. This application Jul. 7, 1981, Ser. No. 281,048

Claims priority, application Japan, Oct. 6, 1979, 54-128465; Oct. 6, 1979, 54-128466; Oct. 23, 1979, 54-135936; Feb. 13, 1980, 55-15496; May 2, 1980, 55-57879

The portion of the term of this patent subsequent to Dec. 28, 1999, has been disclaimed.

Int. Cl.³ C08F 4/66, 4/68

U.S. Cl. 526—124 **9 Claims**

1. A process for the production of a rubbery olefinic copolymer by copolymerization of at least two olefins which comprises copolymerizing at least two olefins in the presence of catalyst components (A) and (B) composed of

(A) a liquid obtained by dissolving a solid titanium trichloride in a hydrocarbon, a halogenated hydrocarbon or a mixture thereof in the presence, as a solubilizing agent, of

(1) 5–0.1 mol, based on 1 mol of titanium, of at least one ether compound represented by the formula

R^1OR^2

wherein R^1 and R^2 are identical or different, and each represents an alkyl, alkenyl, aralkyl or aryl group having 1 to 12 carbon atoms, or

(2) 10–0.01 mol, on the basis of 1 mol of titanium, of at least one compound selected from the group consisting of halogens, interhalogen compounds, halogen compounds of phosphorous or sulfur, and oxyhalogen compounds of phosphorous or sulfur and

(B) an organic metal compound of a metal of Groups I–III in the periodic table being a liquid at room temperature, said copolymerization being effected by feeding to a reactor said catalyst components (A) and (B) in the form of a solution thereby obtaining a random copolymer made up of at least two of said olefinic comonomers, such that not one of the individual monomer units which make up the random copolymer exceeds 80% by weight of the random copolymer.

4,377,672

PROCESS FOR THE POLYMERIZATION OF VINYL CHLORIDE ACCORDING TO THE MICROSUSPENSION PROCESS

Hans Geschonke; Ulrich Goetze, and Kurt Kreilein, all of Pulheim, Fed. Rep. of Germany, assignors to Wacker Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Jan. 28, 1980, Ser. No. 116,218

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1979, 2911333

Int. Cl.³ C08F 2/26, 2/20, 14/06

U.S. Cl. 526—203 9 Claims

1. In the process for the manufacture of vinyl chloride polymers or copolymers according to the microsuspension process by the polymerization of vinyl chloride monomers or vinyl chloride monomers and up to 20% by weight, based on the vinyl chloride content, of α-olefinically unsaturated monomers copolymerizable with vinyl chloride in water in the presence of monomer-soluble radical-initiators using emulsifiers in the pre-homogenized aqueous phase, the improvement consisting of employing from 0.01 to 0.5% by weight, based on the weight of the water, of a water-soluble acidic polymer comprising a homopolymer of an acid selected from the group consisting of acrylic acid, methacrylic acid, fumaric acid, maleic acid and itaconic acid, or an acid anhydride thereof, or a copolymer of said acid with up to 80% by weight of monoolefinically unsaturated monomer copolymerizable with said acid, or a water-soluble salt thereof in the pre-homogenized aqueous phase, the emulsifiers comprising in part from about 0.001 to 0.1% by weight, based on the weight of the water, of an emulsifier having at least one perfluorinated alkyl group having a chain length of from about 6 to 20 carbon atoms.

4,377,673

POLYMERIZATION PRODUCTS OF DI-ACETYLENE-TERMINATED POLYIMIDE DERIVATIVES

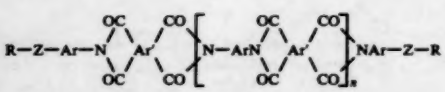
Gaetano F. D'Alelio, deceased, late of South Bend, Ind. (by St. Joseph Bank & Trust Company, executor), and Phillip A. Waitkus, Sheboygan, Wis., assignors to Plastics Engineering Company, Sheboygan, Wis.

Continuation-in-part of Ser. No. 199,605, Oct. 22, 1980, abandoned. This application Mar. 2, 1982, Ser. No. 353,862

Int. Cl.³ C07D 209/34, 471/00; C08F 22/40

U.S. Cl. 526—262 25 Claims

1. An addition polymerization product of the polyimide of the formula:



wherein:

AR′ is a tetravalent aromatic organic radical, the four carbonyl groups being attached directly to separate carbon atoms of said aromatic radical and each pair of carbonyl groups being attached to adjacent carbon atoms in Ar′ except that in the case of Ar′ being a naphthalene radical, one or both pairs of the carbonyl groups may be attached to peri-carbon atoms;

Ar is a divalent aromatic organic radical;

n is an integer having a value of one to 20;

R is hydrogen or an organic moiety containing 1 to 21 carbon atoms; and

Z is the structure —C≡C—C≡C—.

4,377,674

PROCESS FOR THE PRODUCTION OF POLYHYDROXY LIGNIN-CELLULOSE SILICATE POLYMER

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Division of Ser. No. 372,298, Apr. 27, 1982, which is a continuation-in-part of Ser. No. 306,184, Sep. 28, 1981, Pat. No. 4,367,326, which is a continuation-in-part of Ser. No. 257,126, Apr. 24, 1981, Pat. No. 4,313,857, which is a continuation-in-part of Ser. No. 203,730, Nov. 3, 1980, Pat. No. 4,281,110, which is a continuation-in-part of Ser. No. 112,290, Jan. 15, 1980, Pat. No. 4,243,757, which is a continuation-in-part of Ser. No. 29,202, Apr. 12, 1979, Pat. No. 4,220,757. This application Aug. 27, 1982, Ser. No. 412,084

Int. Cl.³ C08G 18/00

U.S. Cl. 527—301 23 Claims

1. The process for the production of polyurethane silicate products by the following steps:

(a) mixing and reacting the following components, thereby producing a polyhydroxy lignin-cellulose silicate polymer;

(i) a broken-down alkali metal plant silicate polymer produced by heating a mixture of 3 parts by weight of a cellulose-containing plant and 1 to 2 parts by weight of an oxidated silicon compound with 2 to 5 parts by weight of a melted alkali metal hydroxide to between 150° C. and 200° C. while agitating for 5 to 60 minutes; in an amount of 100 parts by weight;

(ii) an epoxide compound; in an amount of 1 to 3 parts by weight;

(iii) a Lewis acid, in an amount wherein the pH of the mixture of Components (i), (ii) and (iii) is 5 to 6;

(b) mixing and reacting 100 parts by weight of the polyhydroxy lignin-cellulose silicate polymer of step (a) and 1 to 600 parts by weight of a compound containing at least 2 isocyanate groups, or polyisothiocyanate, thereby producing a polyurethane silicate product.

4,377,675

AMORPHOUS MATERIALS DERIVED FROM AQUEOUS METAL AMMINE SILICONATE SOLUTIONS

William H. Daudt; Cecil L. Frye, both of Midland, Mich., and James F. Hyde, Marco Island, Fla., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 78,417, Sep. 24, 1979. This application Jun. 26, 1981, Ser. No. 277,786

Int. Cl.³ C08G 77/04

U.S. Cl. 528—25 9 Claims

1. Amorphous materials which are prepared by a method which comprises removing R—NH_2 and other volatiles from an aqueous metal ammine siliconate solution which is comprised of the reaction products of (a) oxides and hydroxides of metal, metal derivatives or mixtures thereof which are selected from a group consisting essentially of metals of group IB and metals of group IIB of the Periodic Table of Elements, which are not more acidic than the silanols and siloxanols produced in (c), which dissolve in the reaction mixture to yield metal ammine cations in the presence of R—NH_2;

(b) R—NH_2 where R is H, aminoalkyls with 2-6 carbon atoms, or mixtures thereof and wherein the —NH_2 molar concentration is equal to at least n times the molar concentration of the metal or metal derivative where n is the coordination number of the metal;

(c) a mono-organosilicon material which can undergo hydrolysis in the presence of the other reactants to yield mono-organosilanols or siloxanols, and hydrolysis products which are not more acidic than the silanols or siloxanols, wherein the organomoiety in the mono-organosilicon material contains up to about 50 carbon atoms and is selected from the group consisting of saturated and unsaturated hydrocarbons having from 1 to about 6 carbon atoms, halohydrocarbons having up to 6 carbon atoms and wherein the halo substitution is at a location other than the alpha or beta location, aminohydrocarbons, radicals containing one or more ether or thioether linkages, hydrox-

yfunctional alkyl radicals, carbomethoxyalkyl radicals, carbamoylalkoxy radicals, quaternary ammonium or phosphonium bearing alkyl radicals and mixtures thereof, the mono-organosilicon material being present in an amount sufficient to yield a silicon/metal ratio of from about 1 to about 10; and

(d) water.

4,377,676

NON-PRECONDENSED SILICONE-ALKYD RESINS AND A METHOD FOR THEIR PREPARATION

Laura A. Gauthier, Midland, Mich., and Gary E. LeGrow, Madison, Ind., assignors to Dow Corning Corporation, Midland, Mich.

Filed Sep. 23, 1981, Ser. No. 304,724
Int. Cl.³ C09D 3/64, 3/82
U.S. Cl. 528—26.5 44 Claims

1. A process for producing a resin which comprises contacting and reacting essentially simultaneously

(A) an aliphatic polyhydric alcohol or a mixture of aliphatic polyhydric alcohols;

(B) a polybasic carboxylic acid or an anhydride or mixtures thereof;

(C) an organosilane or a mixture of organosilanes having the general formula

$$R_nSi(OR')_{4-n}$$

wherein R is selected from a group consisting of phenyl, methyl, ethyl, propyl and butyl radicals; R′ is an alkyl radical of 1–4 carbon atoms and n has a value of 1 or 2 and,

(D) at least a stoichiometric amount of water based on the amount of —(OR′) present in the mixture, at a temperature greater than 25° C. for a period of time sufficient to produce a resin with an acid value of 10–150.

4,377,677

METHOD OF PREPARING POLYCARBOSILANES

Tadashi Iwai; Takashi Kawahito, and Masahiro Tokuse, all of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Nov. 5, 1981, Ser. No. 318,596
Claims priority, application Japan, Nov. 11, 1980, 55-157695
Int. Cl.³ C08G 77/60
U.S. Cl. 528—35 10 Claims

1. A process of preparing polycarbosilanes having high molecular weight and having the repetitive silicon-carbon-silicon linkage as the major structural unit, which comprises heating a polysilane having the repetitive silicon-silicon linkage as the major structural unit at 50°–600° C. in an atmosphere of an inert gas and distilling out a low molecular weight polycarbosilane fraction having the number mean molecular weight of 300–600, and then polymerizing said distilled fraction by heating it at 250°–500° C. in atmosphere of an inert gas to form said high molecular weight polycarbosilane.

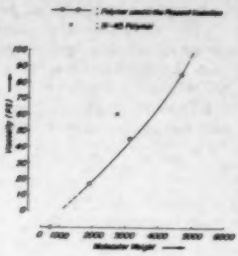
4,377,678

BINDERS FOR POLYDIENE COMPOSITE PROPELLANTS

Daizo Fukuma, Sakado; Shigeru Suzuki; Kensho Shirota, both of Sayama, and Kunihiro Harada, Machida, all of Japan, assignors to Nissan Motor Company, Ltd., Kanagawa and Japan Synthetic Rubber Co., Ltd., Tokyo, both of, Japan

PCT No. PCT/JP79/00252, § 371 Date Jun. 4, 1980, § 102(e) Date Jun. 4, 1980, PCT Pub. No. WO80/00698, PCT Pub. Date Apr. 17, 1980
PCT Filed Oct. 5, 1979, Ser. No. 198,957
Claims priority, application Japan, Oct. 6, 1978, 53/123345
Int. Cl.³ C08G 18/62, 18/48
U.S. Cl. 528—75 5 Claims

1. A binder for a polydiene composite propellant obtained by reacting a polydiene glycol having a hydroxyl group number of 1.8–2.1 and a number average molecular weight of 1,000–5,000 with a trifunctional crosslinking agent, a diisocyanate and a bifunctional chain extender; said polydiene glycol being obtained by polymerizing butadiene in an organic solvent by using a dilithium compound as a catalyst and treating the resulting polymer with a substance selected from the group



consisting of ethylene oxide, propylene oxide, aldehydes and ketones to hydroxylate both terminal groups, and wherein the binder has an average molecular weight between crosslinks from about 7,000 to 15,000.

4,377,679

PHOTOCURABLE COMPOSITIONS BASED ON ACRYLATE POLYESTER URETHANES

Claude J. Schmidle, Trenton, N.J., assignor to Thiokol Corporation, Newtown, Pa.

Filed Jan. 28, 1982, Ser. No. 343,659
Int. Cl.³ C08G 18/68, 18/34, 18/00; C08F 8/00
U.S. Cl. 528—75 9 Claims

1. A process for preparing compositions for use in photopolymerizable compositions comprising:

A. reacting a polyether diol and an acrylic acid in about equal molar proportions, and

B. reacting the product of step A, a hydroxyalkyl acrylate and an organic diisocyanate in about equal molar proportions.

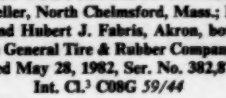
4,377,680

CURING OF POLYGLYCIDYL ETHER RESINS

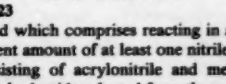
David R. Sponseller, North Chelmsford, Mass.; Earl G. Melby, Uniontown, and Hubert J. Fabris, Akron, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed May 28, 1982, Ser. No. 382,871
Int. Cl.³ C08G 59/44
U.S. Cl. 528—123 28 Claims

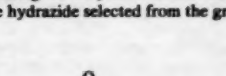
1. The method which comprises reacting in aqueous media at least a sufficient amount of at least one nitrile selected from the group consisting of acrylonitrile and methacrylonitrile with at least one hydrazide selected from the group consisting of



(1)



(2)

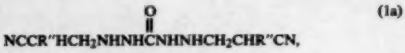


(3)

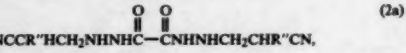
where R is a hydrocarbon radical having from 1 to 30 carbon atoms and where m is a number from 2 to 6 and

(4)

where R′ is a hydrocarbon moiety selected from the group consisting of dimers, trimers, oligomers, polymers and copolymers having an average molecular weight of from about 250 to 5000 and which may contain a minor amount by weight of —C≡N groups and where n is a number from 2 to 10, at a temperature of from about 20° to 100° C. and for a period of time to form at least one compound selected from the group consisting of



(1a)



(2a)

(3a)

where R is a hydrocarbon radical having from 1 to 30 carbon atoms and where m is a number from 2 to 6 and

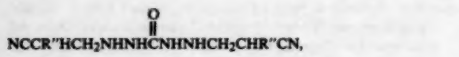
(4a)

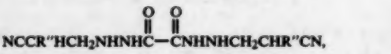
where R′ is a hydrocarbon moiety selected from the group consisting of dimers, trimers, oligomers, polymers and copolymers having an average molecular weight of from 250 to 5000 and which may contain a minor amount by weight of —C≡N groups and where n is a number from 2 to 10 and and where R″ is hydrogen or methyl.

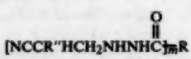
11. A curable composition comprising

(I.) at least one polyglycidyl ether resin having an average of at least two glycidyl ether groups, an epoxide equivalent of from about 130 to 6000 and a molecular weight of from about 300 to 12,000 and

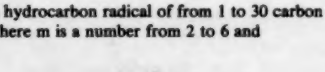
(II.) at least one hydrazide compound selected from group consisting of



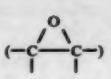




where R is a hydrocarbon radical of from 1 to 30 carbon atoms and where m is a number from 2 to 6 and



where R′ is a hydrocarbon moiety selected from the group consisting of dimers, trimers, oligomers, polymers and copolymers having an average molecular weight of from about 250 to 5000 and which may contain a minor amount by weight of —C≡N groups and where n is a number from 2 to 10 and where R″ is hydrogen or methyl, the equivalent ratio of epoxy



of (I.) to amine (—NH—) of (II.) being from about 1:1 to 12:1, or from about 1:1 to 6:1.

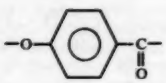
4,377,681

LIQUID CRYSTAL COPOLYESTERS

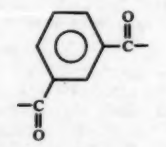
Oliver D. Deex, Clayton, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 4, 1982, Ser. No. 354,568
Int. Cl.³ C08G 63/60
U.S. Cl. 528—193 **4 Claims**

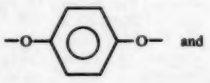
1. A copolyester capable of forming a thermotropic melt phase at a temperature below about 340° C. and having a glass transition temperature of at least about 160° C. and an inherent viscosity determined at 30° C. with a solution of 0.5 gram of copolyester per 100 ml of a solvent composed of 60 parts by weight of phenol and 40 parts by weight of tetrachloroethane of at least about 0.3, consisting essentially of the following divalent radicals:



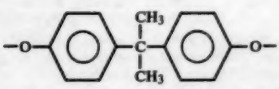
(A)



(B)



(C) and



(D)

wherein the range of radical A is from 10 to 40 mol percent of the copolyester and the range of radical C is from 82 to 95 mole percent, of the total of radicals C and D.

4,377,682

COPOLYESTERS

Masakatsu Ohguchi; Tatsuhiko Shizuki, and Takao Kashihara, all of Ootsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Sep. 30, 1981, Ser. No. 307,362
Claims priority, application Japan, Oct. 2, 1980, 55-138574
Int. Cl.³ C08G 63/66
U.S. Cl. 528—301 **5 Claims**

1. Copolyester formed from dicarboxylic acid components and glycol components characterized in that more than 80 mol % of the dicarboxylic acid components is terephthalic acid or its ester-forming derivative, and that more than 80 mol % of the glycol components is a glycol or two or more glycols selected from ethylene glycol, tetramethylene glycol and 1,4-cyclohexane dimethanol and 1 to 10 weight % thereof, based

on the resulting polyester is a glycol represented by the following formula (I):

$$HO\text{-}(\text{-}C_2H_4O\text{-})_m R\text{-}O\text{-}(\text{-}C_2H_4O\text{-})_n H \quad (I)$$

wherein R is a divalent aliphatic hydrocarbon group having 4 to 20 carbon atoms, m and n are same or different integers, and wherein $3 \leqq m+n \leqq 10$.

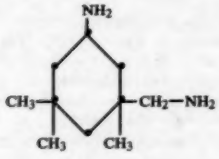
4,377,683

TRANSPARENT COPOLYAMIDE FROM ISOPHORONE DIAMINE AND SUBSTITUTED UNDECANE DIAMINE

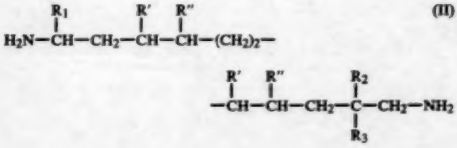
Josef Pfeifer, Therwil, Switzerland, and Dieter Reinehr, Kandern, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 12, 1981, Ser. No. 272,866
Claims priority, application Switzerland, Jun. 23, 1980, 4806/80
Int. Cl.³ C08G 69/26
U.S. Cl. 528—336 10 Claims

1. A thermoplastic, transparent copolyamide obtained by reacting a diamine of the formula I

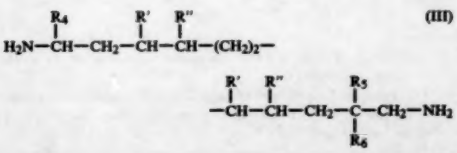


and an aliphatic diamine with isophthalic acid or terephthalic acid or amide-forming derivatives thereof or with a mixture of isophthalic acid and terephthalic acid or amide-forming derivatives thereof, which copolyamide has a reduced specific viscosity of not less than 0.5 dl/g, measured on an 0.5% solution in m-cresol at 25° C., and is obtained by reacting a mixture (A) of the diamine of the formula I and isophthalic acid or terephthalic acid or mixtures or amide-forming derivatives thereof either with a mixture (B) of an aliphatic diamine of the formula II



(II)

and terephthalic acid or an amide-forming derivative thereof or a mixture of terephthalic acid and isophthalic acid or amide-forming derivatives thereof in a molar ratio of terephthalic acid or derivative: isophthalic acid or derivative of 8:2 to 10:0 or with a mixture C of an aliphatic diamine of the formula III



(III)

and terephthalic acid or isophthalic acid or mixtures or amide-forming derivatives thereof, in which formulae R' and R'', independently of one another, are each hydrogen or methyl, R_1 is alkyl having 2–12 C atoms or is substituted or unsubstituted aryl, R_2 is alkyl having 1–8 C atoms, R_3 is hydrogen or alkyl having 1–5 C atoms, R_4 is unsubstituted or C_{1-4}-alkyl-substituted cycloalkyl having 5–12 ring C atoms, R_5 is hydrogen or methyl and R_6 is methyl or R_5 and R_6 together are alkylene having 4–11 C atoms, the proportion of mixture (C) being 60–80 percent by weight and the proportion of mixture (B) being 50–80 percent by weight, relative to the total weight of the reactants, and these percentages by weight relating, in the case of amide-forming derivatives of isophthalic acid or terephthalic acid, to identical functional groups.

4,377,684

DECOLORIZATION OF POLYCARBONATE RESINS

Donald A. Bolon, and John E. Haligren, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 8, 1982, Ser. No. 346,667
Int. Cl.³ C08G 63/62
U.S. Cl. 528—486 11 Claims

1. A process for decolorizing a polycarbonate resin containing a titanate ester of formula $Ti(OAr)_4$, where Ar is an aryl group, comprising (1) reacting said titanate ester with at least a stoichiometric amount of an organic acid anhydride.

4,377,685

PROCESS OF PREPARING SUCROGLYCERIDES

Albert Bouniot; Robert Couraud, both of Melle, and Guy Lartigau, Savigny-sur-Orge, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Aug. 11, 1980, Ser. No. 177,209
Claims priority, application France, Aug. 16, 1979, 79 20758
Int. Cl.³ C07H 13/02
U.S. Cl. 536—119 24 Claims

1. A process of preparing sucroglycerides, which comprises the steps of reacting a triglyceride and an alcohol selected from the group consisting of ethanol and mixtures of ethanol and glycerol, the amount of said ethanol being between about 2% and 30% of the weight of said triglyceride, in the presence of an alcoholysis catalyst at a temperature of between about 80° and 180° C. and introducing to that reaction mixture sucrose and a basic transesterification catalyst while maintaining the mixture at a temperature of between about 120° and 145° C.

4,377,686

METHOD OF PURIFYING FATTY ACID ESTER PRODUCTS

Reuben O. Feuge, New Orleans, and Hampden J. Zeringue, Jr., Destrehan, both of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 8, 1981, Ser. No. 223,509
Int. Cl.³ C11C 3/02; C09F 5/08, 3/00; B01F 17/30
U.S. Cl. 536—119 5 Claims

1. A process for purifying fatty acid ester products containing the salt of an alkali metal comprising:

(a) dissolving in a water-immiscible organic solvent at about 20°–50° C. a quantity of a fatty acid ester product which contains an alkali metal salt of a fatty acid;

(b) mixing the dissolved product solution with a quantity of water sufficient to form a second or aqueous phase;

(c) while the organic and aqueous phases are in contact with each other, mixing and saturating the two phases with carbon dioxide;

(d) separating the aqueous phase from the organic phase; then,

(e) removing the solvent from the organic phase, thus obtaining a purified fatty acid ester product.

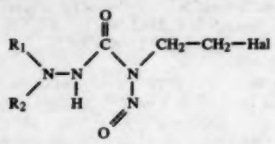
4,377,687

ANALOGS OF 1-(2-CHLOROETHYL)-1-NITROSO-3-(CYCLOHEYL)-UREA SUBSTITUTED BY HETEROCYCLIC RINGS OR ALKYL RADICALS

Gerhard Eisenbrand, Sandhausen, Fed. Rep. of Germany, assignor to Stiftung Deutsches Krebsforschungszentrum, Heidelberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 83,855, Oct. 11, 1979, abandoned. This application Apr. 22, 1981, Ser. No. 256,558
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1978, 2845574
Int. Cl.³ C07D 295/22; C07C 133/02
U.S. Cl. 544—164 11 Claims

1. 1,3-Disubstituted nitroso ureas of the formula:



wherein R_1 and R_2 are selected from the group consisting of hydrogen, acyl, straight chained and branched alkyl groups with up to 6 carbon atoms, and R_1 and R_2 together form a heterocyclic ring containing 4 to 6 carbon atoms and optionally further heteroatoms and such rings with up to 3 substituents selected from the group consisting of lower alkyl, OH, and Hal is selected from the group consisting of chlorine and fluorine, which heterocyclic ring is not the para-methyl piperazine group, said nitroso ureas having a tumor inhibiting effect.

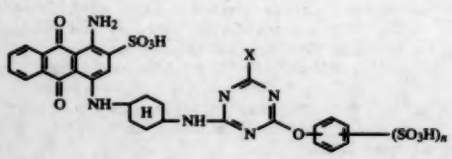
4,377,688

ANTHRAQUINONE REACTIVE DYESTUFFS, THEIR PREPARATION AND THEIR USE FOR DYEING MATERIALS CONTAINING OH GROUPS OR AMIDE GROUPS

Wolfgang Harms; Klaus Wunderlich, both of Leverkusen, and Klaus von Oertzen, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 6, 1979, Ser. No. 100,776
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1978, 2854481
Int. Cl.³ C07D 251/42
U.S. Cl. 544—189 1 Claim

1. A compound of the formula



wherein
X is F, Cl or Br and
n is 1, 2 or 3.

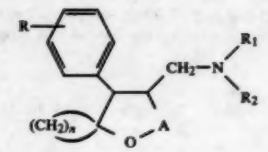
4,377,689

PROCESS FOR PREPARING SPIRO DERIVATIVES

Georges Tsatsas, Athens; Evan E. Costakis, Attikis, and Georges V. Foscolos, Piraeus, all of Greece, assignors to Etablissements Nativelle S.A., Paris, France

Division of Ser. No. 195,692, Oct. 9, 1980. This application Oct. 23, 1981, Ser. No. 314,339
Claims priority, application France, Oct. 9, 1979, 79 25041
Int. Cl.³ C07D 405/06
U.S. Cl. 546—15 3 Claims

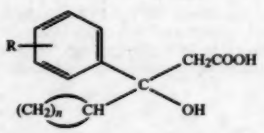
1. A process for preparing a compound of the formula



wherein R is a hydrogen atom, a halogen atom, an alkyl group or an alkoxy group; R_1 and R_2, which may be the same or different, represent a hydrogen atom an alkyl group or together with the nitrogen atom to which they are attached form a nitrogen-containing 5- or 6-membered heterocyclic ring in which the remaining atoms of said ring are carbon atoms; A represents a $>CH_2$ group or a $>C=O$ group; and n is 4 or 5, comprising;

(1) treating β-hydroxyacid of the general formula (II):

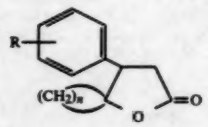
(II)



wherein R and n have the same significance as in the general formula (I), with a strong acid;

(2) hydrolyzing the product of step (1) to form a γ-spirolactone of the general formula (III):

(III)



wherein R and n have the same significance as in the general formula (I);

(3) treating the product of step (2) with magnesium methyl carbonate to form the corresponding α-carboxy-γ-spirolactone;

(4) reacting an aliphatic amine with the α-carboxy-γ-spirolactone of step (3) in the presence of formaldehyde or paraformaldehyde in a Mannich reaction;

(5) reductively opening, if necessary, the lactone ring using lithium aluminum hydride; and

(6) cyclizing by internal dehydration.

4,377,690

HINDERED PIPERIDINE LIGANDS

Paul Moser, Richen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

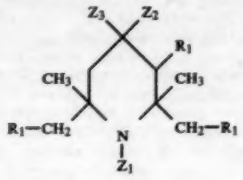
Continuation of Ser. No. 149,209, May 12, 1980, abandoned, which is a division of Ser. No. 922,875, Jul. 10, 1978, Pat. No. 4,231,921. This application Jun. 8, 1981, Ser. No. 271,309

Claims priority, application Switzerland, Jul. 15, 1977, 8793/77

Int. Cl.³ C07D 211/34, 471/10, 471/20

U.S. Cl. 546—19 4 Claims

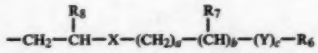
1. A compound of the formula H_rL wherein r is 1 or 2, and L is a group of formula II



(II)

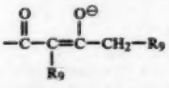
in which R_1 is hydrogen or C_1–C_4 alkyl,

Z_1 is hydrogen or a group of formula III



(III)

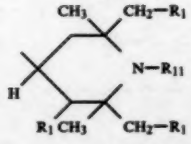
R_6 is a group of formula V



(V)

in which R_9 is hydrogen or C_1–C_4 alkyl, and R_7 and R_8 independently of each other are hydrogen, methyl, phenyl, C_2–C_9 alkoxymethyl or a $—CH_2—O—R_6$ radical, in which R_6 is as defined above, and a is 0, 1 or 2 and b is 0 or 1 and c is 0 or, if a and/or b differ from 0, is also 1, and X and Y independently of each other are —O— or

in which R_{10} is hydrogen, C_1–C_{12} alkyl, C_3–C_8 alkenyl, cyclohexyl, C_3–C_{21} alkoxyalkyl, C_7–C_{13} aralkyl, phenyl, or phenyl substituted by C_1–C_8 alkyl and/or by C_1–C_8 alkoxy, or a group $—CH_2—CH_2—O—R_6$, in which R_6 is as defined above, and R_{10} is also a group of the formula VI

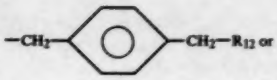


(VI)

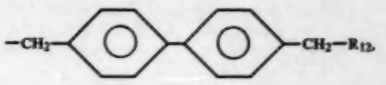
in which

R_1 is as defined above and R_{11} is hydrogen, C_1–C_{12} alkyl, C_3–C_8 alkenyl, C_2–C_{21} alkoxyalkyl, C_7–C_8 aralkyl, an alkanoyl or alkenoyl having 1–4 C atoms, or a group $—CH_2COOR_2$,

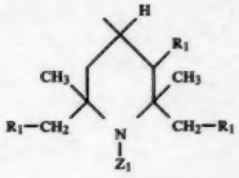
R_2 is C_1–C_8 alkyl, C_3–C_6 alkenyl, phenyl, C_7–C_8 aralkyl or cyclohexyl, and Z_2 is hydrogen, C_2–C_{18} alkanoyloxy, benzoyloxy, or benzoyloxy substituted by C_1–C_8 alkyl or by C_1–C_8 alkoxy, or C_2–C_{18} alkanoylamido or said alkanoylamido substituted on the N-atom by C_1–C_8 alkyl, or one of the groups $—R_{12}$, $—(CH_2)_d—R_{12}$,



or

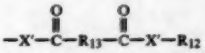


in which d is 2 to 10 and R_{12} is a group of the formula VII



(VII)

in which R_1 and Z_1 are as defined above, or Z_2 is also a group of the formula VIII

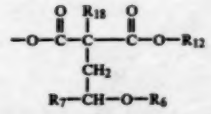


(VIII)

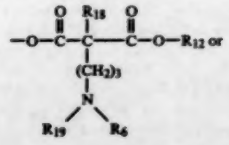
in which R_{12} is as defined above and X' is —O— or

in which R_{14} is hydrogen or C_1–C_4 alkyl, and R_{13} is $—(CH_2)_e—$ or a group

in which e is 0, or 2 to 8 and R_{15} and R_{16} independently of one another are hydrogen, C_1–C_{12} alkyl, C_3–C_8 alkenyl, C_7–C_{11} aralkyl, cyanomethyl, cyanoethyl or a group $—CH_2COOR_{17}$, in which R_{17} is methyl or ethyl, or Z_2 is one of the groups



(IX)



(X)

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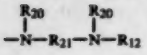
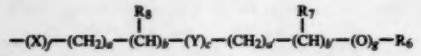
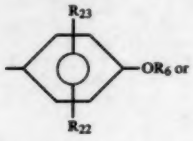


(XI)

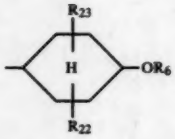
in which R_6, R_7 and R_{12} are as defined above and R_{18} is hydrogen, C_1–C_8 alkyl, allyl, phenyl or benzyl and R_{19} is hydrogen, C_1–C_8 alkyl, allyl or benzyl and R_{20} is C_1–C_4 alkyl or a group of the formula V which is as defined above, and R_{21} is C_2–C_6 alkylene, cyclohexylidene, phenylene, diphenylene, 4,4'-diphenylene oxide or 4,4'-diphenylenemethane, or Z_2 is also a group of the formulae XII, XIII or XIV



(XII)

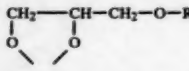


(XIII)

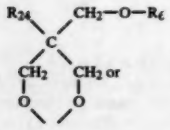


(XIV)

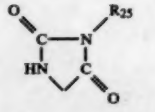
in which a, b, c, X, Y, R_6, R_7 and R_8 are as defined above and f, a' and b' are 0 or 1 and g is 0 or, if a' and/or b' differ from 0, is also 1, and R_{22} and R_{23} independently of one another are hydrogen, C_1–C_4 alkyl, cyclohexyl, phenyl, benzyl, alpha-methylbenzyl or alpha, alpha-dimethylbenzyl, and Z_3 is hydrogen or cyano, or Z_2 and Z_3 together are one of the groups XV, XVI or XVII



(XV)



(XVI)



(XVII)

in which R_6 is as defined above and R_{24} is hydrogen, methyl or ethyl and R_{25} is hydrogen, C_1–C_{18} alkyl, C_3–C_8 alkenyl, cyclohexyl, C_7–C_8 aralkyl or a group —CH-2—$COOR_{26}$ or —CH_2—$CH(R_8)$—O—R_6, in which R_{26} is C_1–C_{18} alkyl and R_6 and R_8 are as defined above, and with the proviso that when R_1, Z_1 and Z_3 are all hydrogen, Z_2 cannot be —OR_6 with the further proviso that each compound must have at least one R_6 group.

4,377,691

PROCESS FOR THE PREPARATION OF 1-(4-HYDROXYPHENYL)-2-(4-BENZYLPIPERIDINO)-1-PROPANOL AND ACID-ADDITION SALTS THEREOF

Bompei Yasui, Ikoma; Tomohisa Miyamoto, Settsu; Katsuyuki Hirsoka, Neyagawa, and Yoshitaka Sako, Osaka, all of Japan, assignors to Kabushiki Kaisha Cosmos Enterprise, Osaka, Japan

Filed Dec. 4, 1980, Ser. No. 213,033

Claims priority, application Japan, Dec. 7, 1979, 54-158112; Dec. 30, 1979, 54-173198; Mar. 27, 1980, 55-38228; Mar. 27, 1980, 55-38229

Int. Cl.³ C07D *211/14*

U.S. Cl. 546—185 **17 Claims**

1. A process for the preparation of 1-(4-hydroxyphenyl)-2-(4-benzylpiperidino)-1-propanol and acid-addition salts thereof in a single reaction container, which comprises brominating 4'-hydroxypropriophenone in a single or mixed solvent selected from the group consisting of methanol, ethanol and a saturated aliphatic ether, removing hydrogen bromide formed in the course of the bromination, adding 4-benzylpyridine and a single or mixed solvent selected from the group consisting of methanol and ethanol to the reaction mixture, heating the reaction mixture under reflux and then subjecting the resultant reaction mixture to catalytic reduction to form 1-(4-hydroxyphenyl)-2-(4-benzylpiperidino)-1-propanol hydrobromide in the reaction mixture.

4,377,692

ANOMALOUS SALTS OF DIBASIC ACIDS

John E. Barry, Adams; Manuel Finkelstein, North Adams, and Sidney D. Ross, Williamstown, all of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Jul. 24, 1981, Ser. No. 286,436

Int. Cl.³ C07D *295/04*

U.S. Cl. 546—186 **10 Claims**

1. An anomalous substituted-amine or quaternary ammonium salt of a dibasic acid wherein said salt is selected from the group consisting of salts containing two dibasic acid molecules per cation, RH_3Y_2, and salts containing three dibasic acid molecules per two cations, $R_2H_4Y_3$, wherein R is a quaternary ammonium or substituted-amine cation derived from the group consisting of tert-butylamine, tri-n-propylamine, N-ethylpiperidine, tetramethylammonium hydroxide and tetraethylammonium hydroxide, and H_2Y is a dibasic acid molecule chosen from the group consisting of adipic, fumaric, glutaric, maleic, phthalic, and succinic acids.

10. A salt according to claim 1 wherein said salt is di-N-ethylpiperidinium tetrahydrogen tri-succinate.

4,377,693

2-CHLORO-4,5-DISUBSTITUTED-THIAZOLES USEFUL AS HERBICIDAL SAFENERS

Robert K. Howe, Bridgeton, and Len F. Lee, Maryland Heights, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

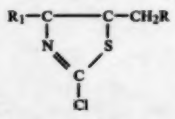
Division of Ser. No. 80,751, Oct. 1, 1979, Pat. No. 4,284,426.

This application Aug. 28, 1980, Ser. No. 182,258

Int. Cl.³ C07D *277/20*

U.S. Cl. 548—202 **7 Claims**

1. A compound of the formula



where

R is equal to halogen, hydroxy, lower alkoxy, or benzyloxy, R_1 is lower alkyl, halo (lower) alkyl, phenyl or phenyl substituted by one to three groups, which may be the same or

different, selected from the group consisting of halogen, lower alkyl, trifluoromethyl and cyano.

4,377,694

HYDROXYALKYL-1,2,4-TRIAZOLIDINE-3,5-DIONES AND A PROCESS FOR THEIR PRODUCTION

Henning Giesecke, Cologne; Rudolf Merten, Leverkusen, and Ludwig Rottmaier, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

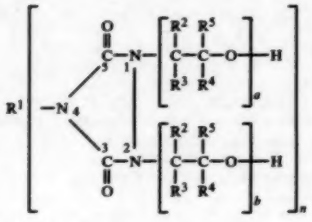
Filed Jun. 29, 1981, Ser. No. 278,648

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1980, 3027551

Int. Cl.[3] **C07D** *249/12, 403/06, 403/08, 403/10*

U.S. Cl. 548—264 **2 Claims**

1. A hydroxyalkyl-1,2,4-triazolidine-3,5-dione of the formula



wherein

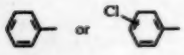
R^1 is selected from the group consisting of

(a) C_tH_{2t+1}— wherein t is 1 to 18

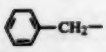
(b) $-(CH_2)_m-$ wherein m is 2 to 12

(c) $-[CH_2-CH(R^6)-O]_p-CH_2-CH(R^6)-$ wherein R^6 is H or CH_3 and p is 1 to 9

(d) $-[CH_2(CH_2)_q-N(R^7)]_r-(CH_2)_q-CH_2-$ wherein R^7 is C_1–C_4—alkyl, q is 1 to 2 and r is 1 to 4

(e) 

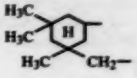
(f)

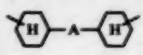
(g) 

(h)

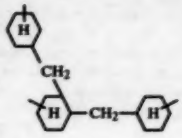
(i)

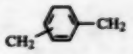
-continued

(j) 

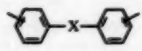
(k) 

wherein A is C_1–C_4—alkylene, O or $-N(CH_3)-$

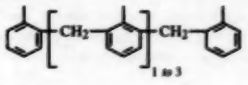
(l) 

(m) 

(n)

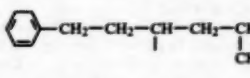
(o) 

wherein X is C_1–C_4—alkylene, O or $-N(CH_3)-$

(p) 

(q) $C_4H_9-O-(CH_2)_3-$

(r) $-(CH_2)_3-O-[CH_2]_{2\text{ to }4}-O-(CH_2)_3-$ and

(s) 

R^2, R^3 and R^4 are hydrogen;

R^5 is hydrogen, methyl, ethyl or phenyl;

a and b are the same or different and represent a number of from 1 to 12 and

n is a number of from 1 to 5.

4,377,695

ω-(2-OXO-BENZAZOLINYL)-ALKANOIC ACID DERIVATIVES

Hans-Heiner Lautenschläger, Pulheim-Stommeln; Hans Betzing, Kerpen-Horrem; Brigitte Stoll, Pulheim, and Manfred Probst, Frechen, all of Fed. Rep. of Germany, assignors to A. Nattermann & Cie GmbH, Cologne, Fed. Rep. of Germany

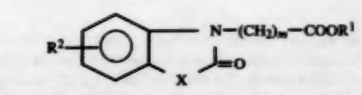
Filed Nov. 6, 1981, Ser. No. 318,963

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1980, 3042481

Int. Cl.[3] **C07D** *263/54, 235/04, 277/62*

U.S. Cl. 548—305 **15 Claims**

1. ω-(2-Oxo-benzazolinyl)-alkanoic acids of formula I



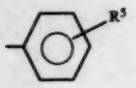
I

wherein

m is an integer ranging from 6 to 10

R^1 is hydrogen, an alkali metal ion or a straight or branched hydrocarbon group having from 1 to 6 carbon atoms,

X is a NR^3-group, R^3 representing —H, $-(CH_2)_n-R^4$ with n being an integer from 0 to 7 and R^4 being a methyl group, the unsubstituted phenyl group or the substituted phenyl group



R^2 and R^5 which may be identical or different from each other, represent hydrogen, halogen, a methyl, a trifluoromethyl, a methoxy, a nitro or an amino group.

4,377,696

PREPARATION OF 4-METHYLIMIDAZOLES

Fritz Graf, Speyer, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 13, 1981, Ser. No. 253,805

Claims priority, application Fed. Rep. of Germany, May 14, 1980, 3018458

Int. Cl.³ C07D *233/58*

U.S. Cl. 548—335 5 Claims

1. A process for the preparation of a 4-methylimidazole which comprises reacting methylglyoxal with ammonia and an aldehyde in aqueous solution, the reaction being carried out at a pH above 7 and all the reactants being brought into contact simultaneously in an aqueous ammonia reaction solution, with the proviso that the aldehyde and the methylglyoxal may be added separately or together for simultaneous contact with the aqueous ammonia solution.

4,377,697

IMIDAZOLE HYDRAZONE AND HYDRAZINE DERIVATIVES

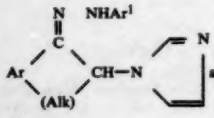
Peter J. Fellner, Marlow; George Ellames, High Wycombe; Christopher D. Floyd, Prestwood, and Paul W. Manley, High Wycombe, all of England, assignors to G. D. Searle & Co., Skokie, Ill.

Filed Feb. 2, 1982, Ser. No. 345,174

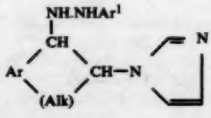
Int. Cl.³ C07D *409/04, 233/56*

U.S. Cl. 548—336 10 Claims

1. Compounds of the general formulae:



(I)



(II)

in which Ar and Ar^1 which may be the same or different, represent aromatic radicals optionally substituted once or more than by substituents selected from halogen, lower alkyl and lower alkoxy and Alk represents an alkylene group containing from 1 to 4 carbon atoms which alkylene group may be interrupted with a heteroatom; and acid addition salts thereof.

4,377,698

2,4 BIS(2-INDOLYL-3)-4-OXOBUTANOIC ACIDS

Nathan N. Crounse, Cincinnati, and Paul J. Schmidt, Sharonville, both of Ohio, assignors to Sterling Drug Inc., New York, N.Y.

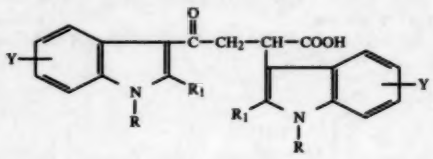
Division of Ser. No. 58,960, Jul. 19, 1976, Pat. No. 4,275,121, which is a continuation-in-part of Ser. No. 829,002, Aug. 30, 1977, abandoned, which is a division of Ser. No. 651,607, Jan. 22, 1976, Pat. No. 4,075,224. This application Jul. 7, 1980, Ser. No. 166,209

Claims priority, application United Kingdom, Jan. 17, 1977, 1196/77

Int. Cl.³ C07D *209/20*

U.S. Cl. 548—455 4 Claims

1. A 2,4-bis(1-R-2-R_1-5/6-Y-3-indolyl)-4-oxobutanoic acid having the formula



wherein:

R represents hydrogen, non-tertiary alkyl of one to eight carbon atoms, alkenyl of two to four carbon atoms, benzyl or benzyl substituted in the benzene ring by one or two of halo or alkyl of one to three carbon atoms;

R_1 represents hydrogen, alkyl of one to three carbon atoms or phenyl; and

Y represents one or two of hydrogen, alkyl of one to three carbon atoms, alkoxy of one to three carbon atoms, halor or nitro with the proviso that R cannot be hydrogen or methyl when R_1 is methyl and Y is hydrogen.

4,377,699

5-CHLORO-INDOLE PREPARATION

Manfred Maurer, Kirchheim; Winfried Orth, Hassloch, and Werner Fickert, Mannheim, all of Fed. Rep. of Germany, assignors to Rutgerswerke Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 9, 1981, Ser. No. 300,607

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1980, 3035403

Int. Cl.³ C07D *209/08*

U.S. Cl. 548—469 10 Claims

1. A process for the preparation of 5-chloro-indole comprising reacting indoline in a chlorine-inert organic solvent with an acylating agent of an organic carboxylic acid to obtain the corresponding 1-acyl-indoline, reacting the latter in the presence of water and a basic agent with chlorine to form 5-chloro-1-acyl-indoline, subjecting the latter to acid or alkaline saponification to obtain 5-chloro-indoline, and reacting the latter in a water-immiscible organic solvent by heating with an aromatic nitrocompound in the presence of a finely powdered ruthenium catalyst to form 5-chloro-indole.

4,377,700

PROCESS FOR THE PREPARATION OF N-(CYCLOHEXYLTHIO)-PHTHALIMIDE

Jürgen Wassen, Leverkusen, and Heinrich Königshofen, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 8, 1981, Ser. No. 299,667

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1980, 3034397

Int. Cl.³ C07D *209/48*

U.S. Cl. 548—475 4 Claims

1. In the process of preparing N-(cyclohexylthio)-phthali-

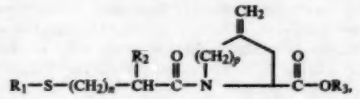
mide by the reaction of one mol of phthalimide with one mol of cyclohexylsulphenylchloride in the presence of a base, the improvement which comprises employing an aqueous solution of alkali metal hydroxide or alkaline earth metal hydroxide as the base in an amount which supplies at least one mol of said base and up to a 10 mol % excess of said base, based on cyclohexylsulphenylchloride.

4,377,701
4-METHYLENE-1-[[(ALRANOYL OR ARYLCARBONYL)MERCAPTO]ACYL]PROLINE AND PIPECOLIC ACID

Sesha I. Natarajan, Neshanic Station, and Miguel A. Ondetti, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sep. 21, 1981, Ser. No. 304,148
Int. Cl.³ C07D 207/22, 211/78
U.S. Cl. 548—533 **9 Claims**

1. A compound having the formula



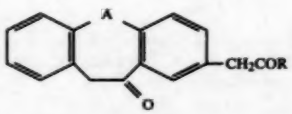
and salts thereof, wherein R_1 is alkanoyl or arylcarbonyl;
R_2 is hydrogen or alkyl;
R_3 is hydrogen, alkyl or arylalkyl;
n is 1 or 2; and
p is 1 or 2.

4,377,702
ACETIC ACID DERIVATIVES

Yasuo Fujimoto, Tokyo, and Shigeru Yamabe, Kobe, both of Japan, assignors to Nippon Chemiphar Co., Ltd., Tokyo, Japan

Division of Ser. No. 15,610, Feb. 2, 1979, Pat. No. 4,263,437.
This application Sep. 15, 1980, Ser. No. 187,068
Claims priority, application Japan, Mar. 1, 1978, 53-22097
The portion of the term of this patent subsequent to May 27, 1997, has been disclaimed.
Int. Cl.³ C07D 313/14, 337/14
U.S. Cl. 549—12 **5 Claims**

1. A compound of the formula,



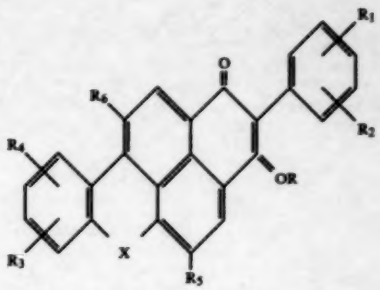
wherein A represents an oxygen or sulfur atom, and R represents hydroxy, amino or a lower alkoxy group having 1 to 5 carbon atoms.

4,377,703
PROCESS FOR PREPARING BENZOXANTHENE AND BENZOTHIOXANTHENE DYESTUFFS

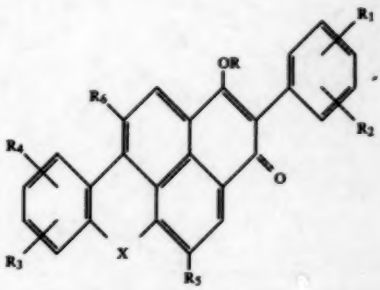
Hans-Gerd Elinkmann, Frankfurt am Main, and Emmerich Pauthory, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 154,320, May 29, 1980, abandoned.
This application Nov. 6, 1981, Ser. No. 319,047
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1979, 2922374
Int. Cl.³ C07D 335/04, 311/78
U.S. Cl. 549—24 **7 Claims**

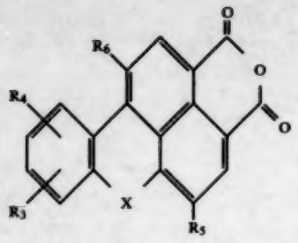
1. In an industrial process for the manufacture of a mixture of a benzoxanthene or benzothioxanthene dyestuff of the formula



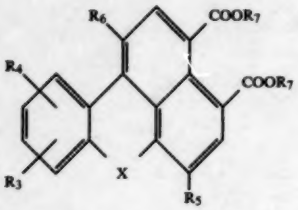
with its isomer of the formula



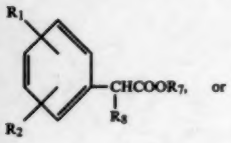
wherein X is oxygen or sulfur, R is alkyl of 1 to 20 carbon atoms, alkyl of 1 to 20 carbom atoms which may be substituted by chlorine, bromine, alkoxy of 1 to 4 carbon atoms, hydroxy, cyano or phenyl, benzoyl, alkanoyl of 1 to 20 carbon atoms, benzene sulfonyl or p-toluene sulfonyl, R_1 and R_2 are hydrogen, chlorine, bromine, phenyl, alkyl of 1 to 20 carbon atoms, alkanoyloxy of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkoxycarbonyl of 2 to 5 carbon atoms, nitro, alkylthio of 1 to 4 carbon atoms or alkylsulfonyl of 1 to 4 carbon atoms or, when together and adjacent, are —CH=CH—CH=CH— to form a fused benzene ring, R_3 and R_4 are hydrogen, chlorine, bromine, cyano, carbalkoxy of 1 to 4 carbon atoms, phenyl, alkyl of 1 to 4 carbon atoms of alkoxy of 1 to 4 carbon atoms and R_5 and R_6 are hydrogen, alkoxy of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms which may be substituted by chloro, bromo, hydroxy, alkanoyloxy of 1 to 4 carbon atoms or phenyl by heating to a temperature in the range of 150° C. to 260° C., in the presence of an alkaline agent selected from the group consisting of alkali metal hydroxide, carbonate or acetate a benzoxanthene or benzothioxanthene-3,4-dicarboxylic acid anhydride of the formula



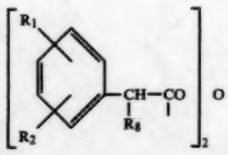
or the derivatives thereof of the formula



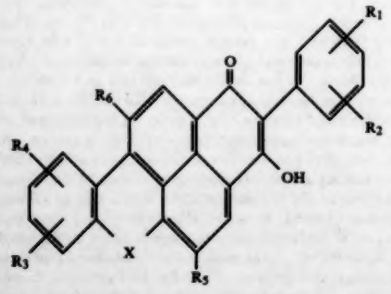
wherein X, R_3, R_4, R_5 and R_6 are as defined above and R_7 is hydrogen or alkyl, with a compound of the formula



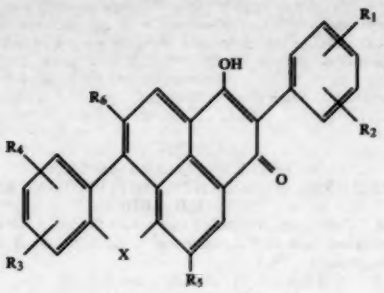
or



wherein R_1, R_2 and R_7 are as defined above and R_8 is hydrogen or hydroxy, and by alkylating or acylating the compounds formed consisting of an isomer mixture of a compound of the formula



and of the formula



wherein X, R_1, R_2, R_3, R_4, R_5 and R_6 and are as defined above, the improvement which comprises conducting the process in a polar organic solvent selected from the group consisting of dimethyl formamide, dimethyl acetamide, N-methylpyrrolidone, hexamethyl phosphoric acid trisamide, dimethyl sulfoxide, o-dichlorobenzene, nitrobenzene and α-chloronaphthalene without isolating the isomer mixture of the intermediates containing hydroxy groups.

4,377,704

HETERO-PROSTAGLANDIN DERIVATIVES AND PROCESSES FOR PREPARING THEM

Stephan Gero, Les Ulis; Jeanine Cleophax, Palaiseau; Jean-Claude Barriere, Massy, and Andre Cier, Neuilly-sur-Seine, all of France, assignors to Sanofi, Paris, France

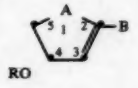
Filed Aug. 3, 1981, Ser. No. 289,391

Int. Cl.³ C07C *47/40*; **C07D** *319/06, 339/06, 407/08*

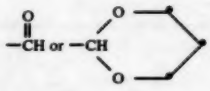
U.S. Cl. 549—39 **8 Claims**

1. A cyclopentene derivative represented by the formula:

Ia

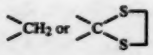


in which R represents a hydroxy-protecting group of the formula $—CH_2R_1$ in which R_1 represents an phenyl or methylphenyl, B represents

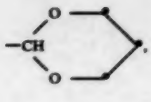


and A is such that: when B represents

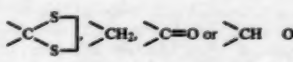
A represents



when B represents



A represents



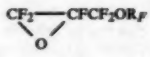
4,377,705

PERFLUORODIGLYCIDYL ETHERS AND PRECURSORS THEREFOR

Carl G. Krespan, and Thomas R. Darling, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 250,907, Apr. 3, 1981. This application Jan. 25, 1982, Ser. No. 342,716
Int. Cl.³ C07D 303/48
U.S. Cl. 549—550 3 Claims

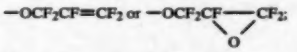
1. Perfluoroglycidyl ethers of the formula



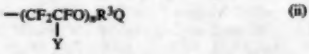
wherein R_F is:

(i)

wherein R^1 is a carbon-carbon bond or a linear or branched perfluoroalkylene group of 1 to 12 carbon atoms; Q is

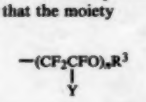


Y and Y' are —F or $—CF_3$, provided that only one of Y and Y' can be $—CF_3$; or



(ii)

wherein R^3 is a linear or branched perfluoroalkylene group of carbon content such that the moiety



does not exceed 15 carbon atoms; Y, independently, is —F or $—CF_3$; n is 1 to 4; and Q is as defined above.

4,377,706

POLYALKOXYSILYLENOLETHERS

John E. Hallgren, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 26, 1981, Ser. No. 277,525
Int. Cl.³ C07F 7/18, 7/04
U.S. Cl. 556—482 8 Claims

1. Methyldimethoxyisopropenoxysilane.

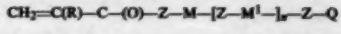
4,377,707

HALOGENATED (METH) ACRYLATE COMPOUNDS

Clinton J. Boriack, Freeport, and Hans R. Friedli, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 17, 1981, Ser. No. 331,748
Int. Cl.³ C07C 69/54, 69/63, 153/09
U.S. Cl. 560—220 12 Claims

1. A compound having the formula

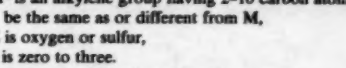


where

Q is the 2,3-dihalodicyclopentyl group

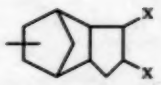
X is chlorine or bromine,
R is hydrogen or methyl,
M is an alkylene group having 2–10 carbon atoms,
M^1 is an alkylene group having 2–10 carbon atoms and can be the same as or different from M,
Z is oxygen or sulfur,
n is zero to three.

2. A compound having a formula



where

Q is the 2,3-dihalodicyclopentyl group



X is chlorine or bromine,
R is hydrogen or methyl,
M is an alkylene group having 2–10 carbon atoms,
M^1 is an alkylene group having 2–10 carbon atoms and can be the same as or different from M,
Z is oxygen or sulfur,
n is zero or three.

4,377,708

HYDROCARBOXYLATION OF VINYL ALKANOATES

Donald E. Morris, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 14, 1977, Ser. No. 842,438
Int. Cl.³ C07C 51/14, 59/08, 67/38, 69/14
U.S. Cl. 560—266 18 Claims

1. A process for the hydrocarboxylation of vinyl alkanoates to produce α-acyloxypropionic acid which comprises contacting the vinyl alkanoates with carbon monoxide and water in a liquid reaction medium comprising a low concentration, no greater than about 3% by weight, of water and a catalyst containing palladium and tertiary organophosphine, and excess tertiary organophosphine.

4,377,709
PROCESS FOR THE MANUFACTURE OF 5-OXOALKANOIC ACIDS

Werner H. Müller, Eppstein, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 19, 1980, Ser. No. 218,027
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2952044
Int. Cl.³ C07C 51/00
U.S. Cl. 562—459 3 Claims

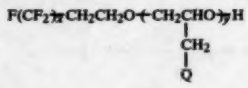
1. In a process for the manufacture of 5-oxoalkanoic acid consisting essentially of reacting a ketone containing at least one hydrogen atom in the α-position with respect to the keto group with an α, β-unsaturated acid at elevated temperature, the improvement which consists essentially of conducting said reaction with the use of a secondary amine catalyst.

4,377,710
QUATERNIZED EPICHLOROHYDRIN ADDUCTS OF PERFLUORO SUBSTITUTED ETHANOLS

Virgil L. Seale, Houston, Tex.; James R. Stanford, Duncan, Okla.; James E. Briscoe, Duncan, Okla., and Glenn S. Penny, Duncan, Okla., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Mar. 8, 1982, Ser. No. 355,503
Int. Cl.³ C07C 87/68, 87/30
U.S. Cl. 564—281 8 Claims

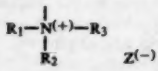
1. A composition represented by the formula:



wherein x is an integer of from 2–12; y is an integer or fractional integer of from 1–20; Q is chosen from the group consisting of:

(a) chloro, bromo, and iodo halogen radicals, and

(b) a cationic nitrogen radical represented by the formula:



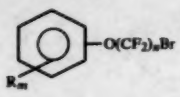
wherein R_1, R_2, and R_3 are hydrocarbon radicals which contain from 1–30 carbon atoms and are further selected from the group consisting of alkyl, aryl, alkaryl and cyclo aliphatic radicals, with the proviso that when any of R_1, R_2, and R_3 exceed four carbon atoms, the other two hydrocarbon radicals are each chosen from the group consisting of ethyl and methyl hydrocarbon radicals; Z is a halogen anion chosen from the group consisting of chloride, bromide, and iodide with the further proviso that at least 50% of the radicals represented by Q are (b) radicals.

4,377,711
NOVEL AROMATIC BROMOPOLYFLUOROALKYL ETHERS AND METHOD FOR THE PREPARATION THEREOF

Isabelle Rico, Paris, and Claude Wakselman, Villebon-sur-Yvette, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Nov. 4, 1981, Ser. No. 318,147
Int. Cl.³ C07C 43/205
U.S. Cl. 568—888 17 Claims

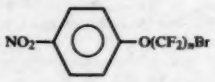
1. Aromatic bromopolyfluoroalkylethers of the formula:



(I)

where n is equal to 1 or 2; m is equal to 1, 2, 3, or 4; and R represents at least one moiety selected from the group consisting of hydrogen, the alkyl radicals having from 1 to 12 carbon atoms, the phenyl radical, the alkoxy radicals having from 1 to 12 carbon atoms, the phenyloxy radical, and the radicals NO_2, CN, Cl, F, Br, I, CF_3, $CONR_1R_2$ and NR_1R_2 where R_1 and R_2 are identical or different and represent each a hydrogen or an alkyl radical having from 1 to 6 carbons atoms.

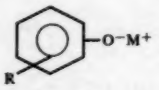
6. Aromatic bromopolyfluoroalkylethers according to claim 1, having the formula:



7. A process for preparing the compounds of claim 1, characterized in that a bromine compound having the formula:

$$Br(CF_2)_n—X \qquad (II)$$

where X represents chlorine or bromine and n is equal to 1 or 2 is reacted with a phenate of the formula:



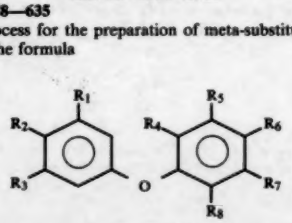
where R is as defined in claim 1 and M^+ represents a cation derived from an alkaline metal, said reaction being carried out in an anhydrous polar aprotic solvent in the presence of a thiol reaction initiator.

4,377,712
PREPARATION OF META-SUBSTITUTED DIARYL ETHERS

Arthur M. Foster, Birmingham, Mich., and James J. Maul, Grand Island, N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

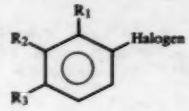
Continuation-in-part of Ser. No. 28,297, Apr. 9, 1979, abandoned. This application Feb. 23, 1981, Ser. No. 237,194
Int. Cl.³ C07C 41/16
U.S. Cl. 568—635 23 Claims

1. A process for the preparation of meta-substituted diaryl ethers of the formula

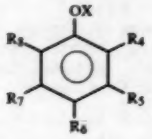


wherein R_1 is selected from the group consisting of alkyl and alkoxy of 1 to 30 carbon atoms, aryl and aryloxy of 6 to 14 carbon atoms and 2-(1,3)dioxolyl; R_2 and R_3 are independently selected from the group consisting of hydrogen, alkyl and alkoxy of 1 to 30 carbon atoms, aryl and aryloxy of 6 to 14 carbon atoms; R_5, R_6, and R_7 are independently selected from the group consisting of hydrogen nitro, alkyl and alkoxy of 1 to

30 carbon atoms, aryl and aryloxy of 6 to 14 carbon atoms; R_4 and R_8 are independently selected from the group consisting of hydrogen, nitro, and linear alkyl and alkoxy of 1 to 14 carbon atoms, with the proviso that if either R_4 or R_8 is a substituent of more than 2 carbon atoms the other substituent is hydrogen; comprising reacting at atmospheric pressure an ortho-halo aryl compound of the formula



wherein R_1, R_2 and R_3 are as previously defined, and halogen is chlorine or bromine; with a phenol compound of the formula



wherein R_4, R_5, R_6, R_7 and R_8 are as previously defined, and X is hydrogen or an alkali metal; in an aprotic, substantially non-nucleophilic, polar solvent at a temperature of about 110° Celsius to about the reflux temperature of the reaction medium, in the presence of an alkali metal base selected from an alkali metal hydroxide and alkali metal carbonate in a molar ratio of alkali metal base: phenol compound of greater than about 1.0 to about 4.0 when X is hydrogen and greater than about 0 to about 3.0 when X is an alkali metal.

4,377,713

CHEMICAL PROCESS FOR PREPARING 3-PHENOXYBENZYL CHLORIDE

Kestutis A. Keblys, Southfield, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 836,428, Sep. 26, 1977, Pat. No. 4,326,089. This application Jan. 18, 1982, Ser. No. 340,321

The portion of the term of this patent subsequent to Apr. 20, 1999, has been disclaimed.

Int. Cl.³ C07C *41/22*

U.S. Cl. 568—639 **3 Claims**

1. A process for preparing m-phenoxybenzyl chloride, or m-phenoxybenzal chloride, or a mixture thereof, said process comprising chlorinating m-phenoxytoluene with chlorine at a temperature of about 250°–260° C., said process being conducted in the absence of a catalyst and in the absence of added u.v. radiation, said process being characterized by formation of a low amount of nuclear chlorinated by-product.

4,377,714

METHYL SUBSTITUTED OXOBICYCLO-4,4,0-DECANE DERIVATIVES, PROCESS FOR PREPARING SAME AND ORGANOLEPTIC USES THEREOF

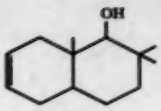
Takao Yoshida, West Long Branch, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Filed Oct. 22, 1981, Ser. No. 313,931

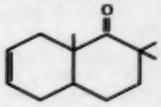
Int. Cl.³ C07C *29/136*

U.S. Cl. 568—819 **6 Claims**

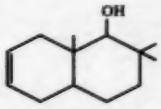
1. A process for preparing a compound defined according to the structure:



comprising the step of intimately admixing a compound having the structure:

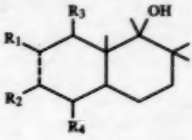


with an isopropyl magnesium halide in the presence of diethyl ether at a temperature of from 10° C. up to 30° C. in order to form an organometallic salt; then hydrolyzing the organometallic salt with an ammonium chloride solution; and then distilling the compound having the structure:

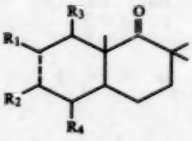


from the reaction mass.

5. A process for forming at least one compound defined according to the structure:



said reaction being carried out in the presence of a solvent selected from the group consisting of benzene, tetrahydrofuran and diethyl ether; wherein R_1, R_2, R_3 and R_4 each represents methyl or hydrogen; and wherein the dashed line represents a carbon-carbon single bond or a carbon-carbon double bond comprising the step of reacting a compound having the structure:



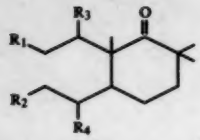
with a compound having the structure:

$$CH_3—M(R_7)_n$$

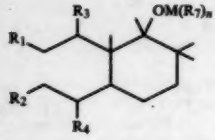
wherein M represents MgX, Na, K, Li, Cd, Mg or Zn; wherein R_7 represents lower alkyl; wherein M is Cd, Mg or Zn when n=1, and M is MgX, Na, K or Li, when n=0, the mole ratio of organometallic compound having the structure:

$$CH_3—M(R_7)_n:$$

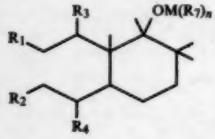
compound having the structure:



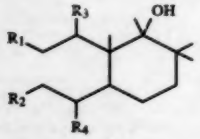
is about 1:1, the reaction being carried out from about −5° C. up to about 40° C. in order to form a compound having the structure:



hydrolyzing the compound having the structure:



using a mineral acid selected from the group consisting of sulfuric acid, phosphoric acid and paratoluene sulphonic acid at a temperature of between 0° and 20° C.; and then isolating the compound having the structure:



from the reaction mass.

4,377,715

PRODUCTION OF PERFLUOROPROPANE

Henry R. Nychka, East Aurora; John B. Hino, Cheektowaga; Richard E. Elbeck, Orchard Park, and Martin A. Robinson, East Amherst, all of N.Y., assignors to Allied Corporation, Morristown, N.J.

Filed Dec. 26, 1979, Ser. No. 107,123

Int. Cl.³ C07C *17/02*

U.S. Cl. 570—123 **10 Claims**

1. A method of preparing octafluoropropane which comprises:

(a) introducing a first gaseous reactant stream comprising fluorine into an elongated inner zone surrounded by porous member which is substantially resistant to fluorine corrosion;

(b) introducing a second gaseous reactant stream outside the porous member comprising a three carbon compound selected from the group consisting of propane, propene and mixtures thereof; and

(c) recovering octafluoropropane from the effluent outside the porous member;

the pressure in the elongated inner zone being greater than the pressure outside the porous member.

4,377,716

METHOD FOR THE PRODUCTION OF HEXAFLUORO-2,3-BIS(TRIFLUOROMETHYL)-2-BUTENE

Louis G. Anello, Hamburg, and Richard F. Sweeney, Elma, both of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 14, 1981, Ser. No. 330,067

Int. Cl.³ C07C *17/00*

U.S. Cl. 570—153 **7 Claims**

1. A method for the production of hexafluoro-2,3-bis(trifluoromethyl-2-butene which comprises heating 2,2,4,4-tetrakis(trifluoromethyl)-1,3-dithietane in the presence of activated carbon.

4,377,717

METHOD FOR THE PRODUCTION OF PERFLUORO-2-METHYLPENTENE-2

Louis G. Anello, Hamburg, and Richard F. Sweeney, Elma, both of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 14, 1981, Ser. No. 330,066

Int. Cl.³ C07C *17/26*

U.S. Cl. 570—172 **7 Claims**

1. A method for the production of perfluoro-2-methylpentene-2 which comprises heating hexafluoropropylene at elevated temperatures in the presence of activated carbon.

4,377,718

PROCESS FOR PRODUCING P-XYLENE

Kimihiko Sato; Tokuji Sakai; Yasuo Yamasaki; Tamio Onodera, and Koji Sumitani, all of Matsuyama, Japan, assignors to Teijin Petrochemical Industries Ltd., Tokyo, Japan

Filed Jul. 21, 1981, Ser. No. 285,464

Claims priority, application Japan, Jul. 25, 1980, 55-101220

Int. Cl.³ C07C *2/68*

U.S. Cl. 585—467 **19 Claims**

1. In a process for producing p-xylene which comprises catalytically methylating toluene with a methylating agent in the gaseous phase, the improvement wherein

(a) said methylation is carried out continuously in a multistage reaction system consisting of a plurality of separate series-connected fixed catalyst layers without separating the resulting xylenes in an intermediate stage,

(b) said toluene is fed together with hydrogen gas into only the first-stage fixed catalyst layer and passed successively through the subsequent fixed catalyst layers, the amount of toluene fed being such that the total weight hourly space velocity of toluene is from 1 to 300 hr^{-1},

(c) said methylating agent is fed into each of said fixed catalyst layers, if desired together with hydrogen gas, the amount of the methylating agent fed into each catalyst layer being 0.01/t moles to 1/t moles, in which t is the number of methyl groups in the methylating agent, per mole of toluene fed into the first-stage catalyst layer, and the total amount of the methylating agent fed into all of the catalyst layers being within the range of 0.1/t moles to 2/t moles, in which t is as defined, per mole of toluene fed into the first-stage catalyst layer, and

(d) each fixed catalyst layer is filled with a catalyst composed of a crystalline aluminosilicate containing magnesium oxide or lanthanide oxide.

4,377,719

1,7-OCTADIENE SYNTHESIS

Charles U. Pittman, Jr., Department of Chemistry, Box H, University of Alabama, University, Ala. 35486, and Ronald Hanes, Athens, Ga., assignors to Charles U. Pittman, Jr., University, Ala.

Division of Ser. No. 729,465, Oct. 4, 1976, Pat. No. 4,243,829. This application Dec. 13, 1978, Ser. No. 969,159

Int. Cl.³ C07C *6/00*

U.S. Cl. 585—509 **8 Claims**

1. A process for preparing 1,7-octadiene which comprises dimerizing butadiene in the presence of a catalytic amount of palladium acetate complexed with a tertiary phosphine which is bound to a synthetic resin, a strong base and formic acid wherein:

the molar ratio of the strong base to the formic acid is 1:1-2;

the mole ratio of tertiary phosphine to palladium is at least 1;

the amount of strong base present is such that the pH of the reaction medium is from about 7.5 to 10.5;

the volume ratio of solvent to strong base is from 2:1 to 10:1; and the solvent is at least one member selected from the group consisting of aromatic hydrocarbons, lower alkyl substituted aromatic hydrocarbons, halogenated aromatic hydrocarbons, halogenated lower aliphatic hydrocarbons, nitriles, amides, dilower alkyl ethers, lower alkyl phenyl ethers, cyclic ethers, diethers, lower alkyl esters of lower alkanoic acids, ketones, and lower alkanols.

4,377,720

PREPARATION OF LINEAR OLEFIN PRODUCTS

Arthur W. Langer, Watchung, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 14, 1981, Ser. No. 330,479

Int. Cl.³ C07C *2/02*

U.S. Cl. 585—527 **9 Claims**

1. A process for preparing linear alpha olefins and waxes having a total product M_n in the range 200 to 700, which comprises polymerizing an ethylene-containing gas in the presence of the reaction product of a Zr metal compound having the formula ZrX_aA_b wherein a=3 or 4, b=0 or 1 and a+b=4 and X=Cl or Br and A is Cl, Br, I, OR or OOCR with an aluminum cocatalyst selected from the group consisting of R_2AlOR' and R_2AlNR_2'', wherein R is a primary, secondary or tertiary alkyl group having about 1 to about 20 carbon atoms and R' or R'' is a primary, secondary or tertiary alkyl group having about 1 to about 20 carbon atoms or an aryl or substituted aryl group, in the presence of a diluent at a temperature of about 50° to 200° C. and an ethylene pressure above about 3.5 MPa, wherein the M_n of said reaction product, is controlled by the molar ratio of aluminum cocatalyst $ZrCl_4$, said molar ratio being less than about 1.

4,377,721

ALKYLATION OF ISOPARAFFINS WITH OLEFINS

Arthur W. Chester, and Yung-Feng Chu, both of Cherry Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 22, 1981, Ser. No. 276,227

Int. Cl.³ C07C *2/58*

U.S. Cl. 585—722 **15 Claims**

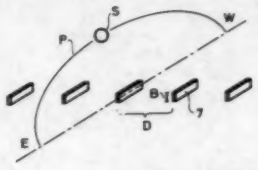
1. A process for effecting alkylation of isoparaffins which comprises contacting an isoparaffin containing from 4 to 7 carbon atoms with an olefin containing from 2 to 7 carbon atoms at a temperature of from about room temperature to about 400° F., a pressure sufficient to maintain at least the isoparaffin or olefin or both in the liquid phase and a molar ratio of isoparaffin to olefin of from about 3:1 to about 20:1 in the presence of a catalyst comprising a synthetic crystalline zeolite exhibiting an X-ray powder diffraction pattern which shows the significant lines set forth in Table 1.

4,377,722

SOLAR CELL UNIT AND A PANEL OR BATTERY COMPOSED OF A PLURALITY OF SUCH SOLAR CELL UNITS

Jens Wested, Herlev, Denmark, assignor to Elektronikcentralen, Horsholm, Denmark

Filed Feb. 13, 1981, Ser. No. 234,199
Claims priority, application Denmark, Feb. 25, 1980, 797/80
Int. Cl.³ H01L 31/04
U.S. Cl. 136—244 23 Claims



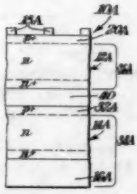
1. A semiconductor solar cell unit comprising: a layer of a first conductivity type semiconductor material, a surface layer of second conductivity type semiconductor material, overlaid in contact with the layer of the first conductivity type semiconductor material, said surface layer being adapted for exposure to tangentially incident solar radiation, said surface layer having a periodic pattern of alternating first and second regions with the first region having a first complex impedance to a tangentially incident plane wave of solar radiation and the second region having a second complex impedance to the incident plane wave of solar radiation, the complex impedances of the first and second regions being different and causing the generation of a local Hartree-harmonics field whereby the local Hartree-harmonics field interferes with any tangentially incident solar radiation to deflect said tangentially incident radiation towards said surface layer, thereby increasing the effective area of the solar cell for converting solar energy into electricity.

4,377,723

HIGH EFFICIENCY THIN-FILM MULTIPLE-GAP PHOTOVOLTAIC DEVICE

Vikram L. Dalal, Newark, Del., assignor to The University of Delaware, Newark, Del.

Filed May 2, 1980, Ser. No. 146,323
Int. Cl.³ H01L 31/06, 31/18
U.S. Cl. 136—249 30 Claims



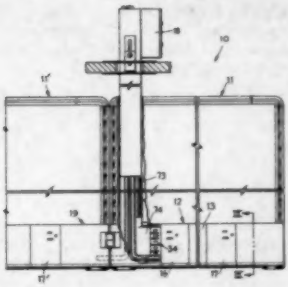
1. In a thin-film multiple-gap photovoltaic device having an opaque electrical contact and a transparent electrical contact with a first cell and a second cell therebetween and with the first cell being adjacent the transparent electrical contact and the second cell being adjacent the opaque electrical contact, each of the cells having a junction layer and a base layer and an electrical junction therebetween and each base layer comprising a base region and an intermediate region with the intermediate region being adjacent the electrical junction layer, the improvement being each of said cells being made from semiconductor materials selected from Group IV elements and their alloys in the amorphous state, said first cell having a higher bandgap than the bandgap of said second cell, and an optically transparent amorphous semiconductor buffer layer of the same conductivity type as the conductivity type of the junction layer of said second cell between said first cell and said second cell for connecting said cells together.

4,377,724

SPACE DIVIDER WALL STRUCTURE WITH MULTIPLE CIRCUIT POWER SYSTEM

Harold R. Wilson, Holland Township, Ottawa County, Mich., assignor to Haworth Mfg., Inc., Holland, Mich.

Continuation of Ser. No. 854,685, Nov. 25, 1977, abandoned.
This application Jul. 10, 1979, Ser. No. 56,198
Int. Cl.³ H02G 3/00
U.S. Cl. 174—48 7 Claims



1. In a substantially freestanding space divider system formed from a plurality of series-connected upright prefabricated panels, some of said panels having a pair of electrical power blocks fixedly mounted thereon adjacent the opposite lower corners thereof and disposed substantially between the opposite sidewalls of the respective panel, cable means extending interiorly of the respective panel and electrically connecting together the pair of said power blocks as associated with said respective panel, some of said power blocks having a conventional electrical receptacle associated therewith and opening outwardly through the panel sidewall for permitting a conventional electrical plug to be inserted therein, flexible electrical connector means extending between the power blocks of adjacent series-connected panels for electrically connecting the power blocks together, said flexible connector means including connector parts disposed adjacent the opposite ends thereof and adapted for releasable electrical engagement with the connected power blocks, each connector part comprising one-half of a separable plug-type electrical connection, the other half of said plug-type electrical connection being integrally associated with the power block, and a power supply conduit releasably electrically connected to a selected one of said power blocks for supplying electrical energy to said series-connected panels, said power supply conduit having a connecting portion releasably engaged with said selected one power block, said power supply conduit having the other end thereof connectible to an electrical potential source, comprising the improvement wherein said power supply conduit includes five electrically conductive wires terminating in said connecting portion, each said power block having at least five electrical conductor members positioned therein and electrically insulated from one another, the five conductor members of said selected one power block being respectively and individually electrically connected to a selected one of said five wires, said flexible connector means including at least five internal conductive elements extending between and electrically connected to said connector parts, the receptacle associated with a first said series-connected panel being connected to a first pair of said conductor members as associated with the power block of the respective panel so that said receptacle as

connected defines a first electrical circuit, the receptacle associated with a second said series-connected panel being connected to a second pair of said conductor members as associated with the power block of the respective panel so that said last-mentioned receptacle as connected defines a second electrical circuit which is different from said first electrical circuit, light fixture means mounted on at least one of said series-connected panels adjacent the upper edge thereof, an elongated electrical conductor connected to said light fixture means and extending downwardly through the interior of the respective panel and terminating in a pluglike connection means which is releasably engaged with the power block of said panel, said power block having connecting means associated therewith for releasable engagement with said pluglike connection means, said connecting means being connected to a third pair of said conductor members so as to define a third electrical circuit which is different from said first and second electrical circuits, whereby said lighting fixture means is connected to said third electrical circuit.

4,377,725

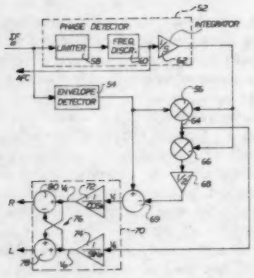
ASYNCHRONOUS MULTICHANNEL RECEIVER

David L. Hershberger, Quincy, Ill., assignor to Harris Corporation, Cleveland, Ohio

Continuation of Ser. No. 934,811, Aug. 18, 1978, abandoned. This application Apr. 10, 1980, Ser. No. 138,846

Int. Cl.³ H04H 5/00

U.S. Cl. 179—1 GS **12 Claims**



1. Apparatus for use in a system for receiving a modulated signal having a modulated in-phase component and a modulated quadrature-phase component, said apparatus being operative to demodulate said quadrature-phase component, comprising:

means for detecting the envelope of said modulated signal to provide an envelope signal;

means for detecting the phase of said modulated signal to provide a phase signal;

means for multiplying said envelope signal by said phase signal so as to provide a product signal;

means responsive to said phase and envelope signals for generating a distortion correction signal which varies generally with the difference between said product signal and the signal modulated upon said quadrature-phase component; and

means for combining said product signal and said distortion correction signal so as to derive a distortion corrected product signal corresponding generally to said signal modulated upon said quadrature-phase component.

4,377,726

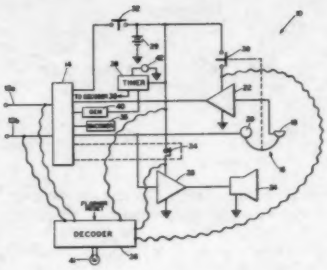
SELECTIVE PAGING AND INTERCOMMUNICATION SYSTEM

William H. Schiffbauer, Uniontown, and Richard A. Watson, Finleyville, both of Pa., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed May 21, 1980, Ser. No. 152,212

Int. Cl.³ H04M 13/00

U.S. Cl. 179—1 H **2 Claims**



1. A station selective paging and intercommunication system comprising:

at least three transceiver units operatively connected in parallel to each other with each unit having its own self-contained power source;

each of said transceiver units also having push-to-page and push-to-talk switches and responsive thereto means for permitting individual selective addressing and communication between any two units without paging or communicating with any of the remaining at least three transceiver units, each of said units being selectively addressable by paging the unit no longer than a predetermined time interval and once addressed generating a responsive beep back signal to the sending transceiver unit to indicate it is receiving the paging signal; and

each of said means for permitting individual selective addressing and communication having signal encoder and decoder circuitry, said decoder being dual tone, multifrequency responsive depending upon the particular unit selected for addressing and communication.

4,377,727

STETHOSCOPE HAVING MEANS FOR MEASURING PULSE FREQUENCY

Joseph C. Schwalbach, 6455 La Jolla Blvd., La Jolla, Calif. 92037

Filed Dec. 24, 1980, Ser. No. 220,136

Int. Cl.³ A61B 5/02

U.S. Cl. 179—1 ST **8 Claims**

1. In a stethoscope having means for conducting directly to the ears of the user heart or other body sounds of a living subject examined therewith, the improvement comprising an impulse producer capable of producing a series of timed reference impulses having a frequency range of the order of the frequency of heart pulses of living subjects and which can be detected by the stethoscope user at the same time that heart pulses of a living subject being examined with the stethoscope can be heard by such user, means including a movable member for adjusting the frequency of the reference impulses produced by the impulse producer; and readout means indicating the frequency of the impulses produced by the impulse producer at any given position of the movable member, wherefore, movement of the movable member as necessary to synchronize the

frequency of the reference impulses with that of heart pulses simultaneously detected by the user causes the readout means

to indicate the frequency of said heart pulses when such synchrony is achieved.

4,377,728

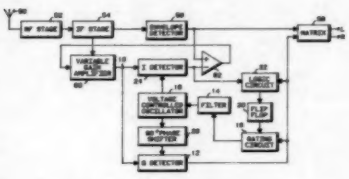
PHASE LOCKED LOOP WITH IMPROVED LOCK-IN

Francis H. Hilbert, Addison, Ill., assignor to Motorola Inc., Schaumburg, Ill.

Filed Mar. 4, 1981, Ser. No. 240,445

Int. Cl.³ H04H 5/00; H03D 3/18

U.S. Cl. 179—1 GS **12 Claims**



1. A phase locked loop comprising:

input means;

first, in-phase detector means coupled to the input means;

second, quadrature detector means coupled to the input means;

filter means coupled to the second detector means output;

oscillator means coupled to be controlled by the filter means output, for providing two output signals in quadrature to the first and second detector means respectively;

logic means coupled to the outputs of the first and second detector means for detecting beats between said output signals, for detecting the relative phase of said signals, and for providing a control signal in response to said detection; and

gating means coupled to control the connection between the second detector means and the filter means in response to the control signal from the logic means.

4,377,729

APPARATUS FOR ELIMINATING PICTURE BOUNCE IN TELEVISION/TELEPHONE SYSTEM

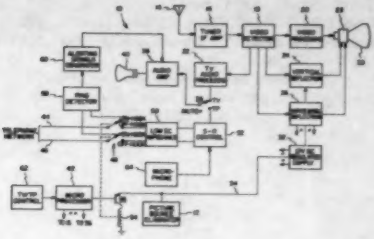
Carl W. Stacy, Elmwood Park, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jul. 8, 1981, Ser. No. 281,458

Int. Cl.³ H04M 11/08; H04N 7/14

U.S. Cl. 179—2 TV **10 Claims**

1. In a communications system including a television receiver having video display means for producing a video display image in accordance with a received television signal and a telephone interface circuit integrated with said television receiver and cooperable with an external telephone network for processing a dialing signal so as to complete a telephone connection with the corresponding telephone number, the



improvement comprising means cooperating with said telephone interface circuit for inhibiting the production of perturbations in said video display image which would otherwise be caused by the processing of said dialing signal for completing said telephone connection.

4,377,730

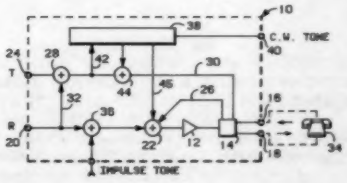
TONE ELIMINATION CIRCUIT

Michael J. Gay, Vaud, Switzerland, and W. David Pace, Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 8, 1981, Ser. No. 271,330

Int. Cl.³ H04B 1/58, 3/20

U.S. Cl. 179—170 NC **5 Claims**



1. In a hybrid circuit providing interface between a pair of unidirectional transmission paths and a balanced two-wire bidirectional subscriber loop including signal generator means responsive to signal inputs for supplying a driving signal into the subscriber loop and being responsive to differential signals on the subscriber loop for supplying driving signals onto the transmit path of the unidirectional transmission paths and having a feedback loop coupled from an output of the signal generator to the input thereof, a cancellation circuit responsive to an impulse signal of predetermined frequency being inserted on the transmit path from the signal generator and a continuous wave signal of said predetermined frequency for generating a first, antiphase, signal of equal magnitude to said impulse signal at a first output thereof, said antiphase signal being summed with said impulse signal to reduce the level of the same.

4,377,731

DEVICE FOR AUTOMATICALLY INTERRUPTING THE SUPPLY OF ELECTRIC POWER TO A MOTOR AND ITS UTILIZATION

Alexandre Georgelin, Bois-Colombes, France, assignor to Faiveley S.A., Saint Ouen, France

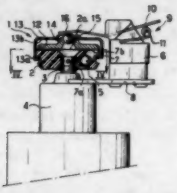
PCT No. PCT/FR81/00072, § 371 Date Jan. 26, 1982, § 102(e) Date Jan. 26, 1982, PCT Pub. No. WO81/03715, PCT Pub. Date Dec. 24, 1981

PCT Filed Jun. 10, 1981, Ser. No. 346,072

Claims priority, application France, Jun. 11, 1980, 80 12935

Int. Cl.³ H01H *35/10*

U.S. Cl. 200—80 R 6 Claims



1. Device for automatically interrupting the supply of electric power to a motor (4) when this latter is locked under the action of a mechanical resistance, comprising means (5) coupled for rotation with the motor (4) and displaceable under the action of the centrifugal force generated at the time of this rotation in order to put the electric power supply of the motor in circuit and in order to put this power supply out of circuit when said centrifugal force drops, characterized in that it comprises a body of revolution (2) fixed on one of the ends of the shaft (3) of the motor (4) and provided with recesses (7) for said masses (5), a disk (12) which is free with respect to this shaft and rests against that face (*2a*) of the body (2) in which the entrances (*7b*) of the recesses (7) of said masses (5) are formed and masks said entrances (*7b*) and a cap (13) covering said disk (12) and attached to the body (2), which is provided on the face remote from the body of revolution (2) with a central protuberance (14) whose apex is in contact with a conductive strip (10) of the switch (6), said central protuberance (14) of the disk (12) being capable of fitting within a complementary opening (15) formed in the end-wall (*13b*) of the cap (13).

4,377,732

METHOD OF AND APPARATUS FOR THE PRODUCTION OF PROFILE MEMBERS AND HOLLOW BODIES FROM A PLURALITY OF METAL STRIPS OF CONSTANT THICKNESS

Hans Preller, Cologne, Fed. Rep. of Germany, assignor to Theodor Wuppermann GmbH, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 24,833, Mar. 28, 1979, abandoned. This application Mar. 25, 1981, Ser. No. 247,472

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1978, 2813635

Int. Cl.³ B23K *13/02*

U.S. Cl. 219—10.43 35 Claims

1. A method for manufacturing profile members, hollow bodies or the like from a plurality of metal strips comprising:

(a) providing a plurality of sources of continuous band-like metal strips, each of said band-like metal strips being of substantial width relative to its thickness and having a constant wall thickness across its entire width as viewed in cross-section and a portion of the width of each of said band-like metal strips having a flat surface;

(b) continuously feeding said band-like metal strips along separate paths, said paths converging and being contiguous at at least one location therealong and being such that said flat surfaces of said contiguous band-like metal strips at said location are aligned;

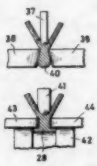
(c) continuously heating to a welding temperature only said portion of the width of each of said band-like metal strips;

(d) directing the contiguous aligned heated portions of said plurality of band-like metal strips through press-welding and shaping means at said location along said path, said press-welding and shaping means contacting surfaces of said continuously moving contiguous heated portions of said band-like metal strips and compressing and press-welding said heated portions together to form a combined continuous member having an integrated portion including a bead-like formation formed from said heated portions and subsequently shaping said bead-like formation into a predetermined configuration; and

(e) continuously altering the shape of a further portion of the width of at least one of said band-like metal strips;

(f) whereby profile members, hollow bodies or the like are formed from an assembly of band-like metal strips and in which the press-welded portion thereof is of greater thickness than said constant wall thickness of said band-like metal strips.

19. Apparatus for the manufacture of profile members, hollow bodies or the like from a plurality of band-like metal strips, each of said band-like metal strips being of substantial width relative to its thickness and having a constant wall thickness across its entire width as viewed in cross-section and a portion of the width of each of said band-like metal strips having a flat surface, comprising:



(a) means for continuously feeding without interruption said plurality of continuous band-like metal strips along separate paths, said paths converging and being contiguous at at least one location therealong and being such that said flat surfaces of said contiguous band-like metal strips at said location are aligned;

(b) means along each of said paths for continuously heating to a welding temperature only said portion of the width of each of said band-like metal strips;

(c) press-welding means at said location along said path downstream of said heating means arranged to contact surfaces of said continuously moving contiguous heated portions of said band-like metal strips and compress and press-weld said heated portions together to form a combined continuous member having an integrated portion including a bead-like formation and shaping means downstream of said press-welding means to shape said bead-like formation into a predetermined configuration; and

(d) means along at least one of said paths for continuously altering the shape of a further portion of the width of at least one of said band-like metal strips;

(e) whereby profile members, hollow bodies or the like may be formed from an assembly of band-like metal strips and in which the press-welded portion thereof is of greater thickness than said constant wall thickness of said band-like metal strips.

4,377,733

TEMPERATURE-SENSING PROBE STRUCTURE FOR WIRELESS TEMPERATURE-SENSING SYSTEM

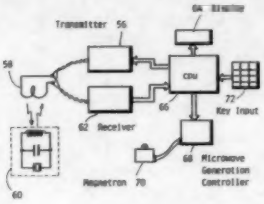
Masumi Yamaguchi, Ikoma; Yoshimi Kumagai, and Kazunari Kotaka, both of Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 29, 1979, Ser. No. 70,729

Claims priority, application Japan, Aug. 31, 1978, 53-107087; Oct. 12, 1978, 53-140582[U]; Oct. 12, 1978, 53-140583[U]; Jul. 31, 1979, 54-98365

Int. Cl.³ H05B 6/68; G01K 7/32

U.S. Cl. 219—10.55 B 16 Claims



1. Wireless temperature sensing means for monitoring the cooking temperature of a foodstuff in a microwave cooking apparatus, comprising:

transmitter means for propagating electromagnetic waves within said microwave cooking apparatus over a range of selectively discrete frequencies;

each one of said discrete frequencies corresponding to a particular cooking temperature value;

wireless probe means insertable in and responsive to the cooking temperature of a said foodstuff and a particular discrete frequency from said transmitter means for receiving and repropagating an electromagnetic wave of said particular discrete frequency corresponding to said cooking temperature value as a measure of the latter; and

detection means for receiving said repropagated electromagnetic wave of said particular frequency and providing an output signal representative of said cooking temperature value of said foodstuff.

4,377,734

METHOD FOR FORMING PATTERNS BY PLASMA ETCHING

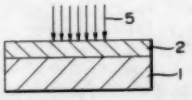
Yoji Mashiko, Nishinomiya; Hirozo Takano; Haruhiko Abe, both of Takarazuka; Sotoju Asai; Kazuo Mizuguchi, both of Amagasaki, and Sumio Nomoto, Itami, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Oct. 9, 1980, Ser. No. 195,380

Claims priority, application Japan, Oct. 13, 1979, 54-133896

Int. Cl.³ B23K 9/00

U.S. Cl. 219—121 PE 4 Claims



1. A method of forming etched patterns on the surface of a workpiece comprising, providing a workpiece to be etched consisting of either polycrystalline silicon, or aluminum, or silicon dioxide, implanting the workpiece surface in a desired pattern with ions of a metal selected from the group consisting of tungsten, niobium and tin in preparation of conversion of portions of the workpiece having said ions in said pattern into a passivator during plasma etching under the presence of oxygen thereby to render said desired pattern on said surface unetchable during said etching, and without further preparation plasma etching the metal ion implanted workpiece with an etching gas mixed with oxygen appropriate to the metal selected, whereby said portions having said pattern remain unetched.

4,377,735

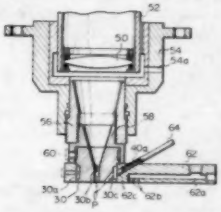
LASER WORKING TREATMENT PROCESS CAPABLE OF CONTROLLING THE FORM OF HEATED PORTION OF A STEEL MATERIAL

Katsuhiro Minamida, Yokohama, and Shigehiro Yamaguchi, Fujisawa, both of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed May 28, 1981, Ser. No. 268,651

Int. Cl.³ B23K 27/00

U.S. Cl. 219—121 LM 6 Claims



1. A laser working treatment process for a steel material, in which laser beams are irradiated to a working point on a steel material while a jet of gas is ejected coaxially with the laser beams to said working point to cause plasma to be generated at the working point, said plasma being pressed against the steel material by ejecting another jet of gas to said working point at an oblique angle to the irradiating direction of said laser beams and the form of said plasma being controlled by changing the ejecting angle of said other jet of gas.

4,377,736

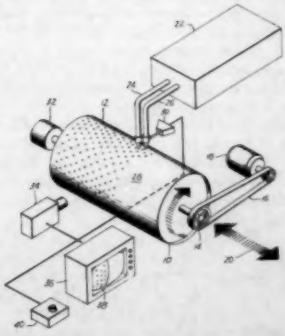
METHOD AND APPARATUS FOR REMOVING MATERIAL FROM A SURFACE

John E. Daunt; John P. Tipton, and John E. Adair, all of Albuquerque, N. Mex., assignors to General Electric Company, Cincinnati, Ohio

Filed Aug. 14, 1981, Ser. No. 292,856

Int. Cl.³ B23K 27/00

U.S. Cl. 219—121 LH 8 Claims



1. In a method for making a plurality of holes through a surface of a member in which the holes are generated by an

energy beam sufficient to vaporize material of the workpiece and create a light flash, the method of inspecting and controlling the position of such plurality of holes comprising:

determining the relative position of the generated holes by a light sensing means responsive to the light flash resulting from material of the member vaporizing as the energy beam produces each hole, each light flash illuminating an actual hole pattern in the vicinity of the hole from which the flash is generated;

comparing the actual hole pattern with a preselected hole pattern; and then

adjusting the position of the energy beam if required to correct undesirable error in the actual hole pattern.

4,377,737

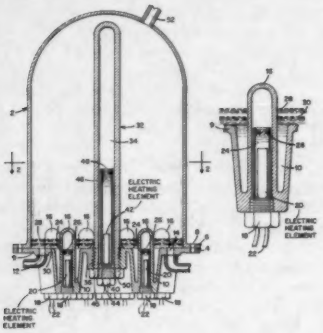
ELECTRICALLY HEATED STEAM BOILER FOR GENERATING SUPERHEATED STEAM

Clyde F. Berry, R.F.D. 7, Box 169 C, Manchester, N.H. 03104

Filed Jan. 30, 1981, Ser. No. 229,867

Int. Cl.³ F24H *1/20*; F22B *1/28*; H05B *3/78*

U.S. Cl. 219—275 **3 Claims**



1. Means for producing superheated steam,

said means comprising a steam boiler having a bottom wall and a steam outlet,

means for maintaining a controlled depth and volume of water in said boiler,

electrically energized means for heating the said boiler water to produce saturated steam in said boiler at any desired temperature and pressure,

said boiler water heating means being in the form of at least one sealed high pressure tube, each tube having therein an electrically energized heating element and a limited quantity of water whereby high pressure high temperature saturated steam will be produced in the tube upon energization of said heating element,

each of said at least one sealed high pressure tube residing in a boiler wate filled well extending through and below the bottom wall of said boiler,

the vertical dimension of the heat transferring surface of each of said at least one tube being substantially greater than the said controlled depth of the boiler water,

electrically operated superheating means fixed within said boiler for raising the temperature of said saturated steam to a superheated temperature,

said superheating means comprising a sealed high pressure vessel in the form of a vertical tube having therein a limited quantity of water and an electrically energized heating element disposed in said water for generating saturated steam in said vessel at a temperature well above the temperature of the saturated steam in said boiler,

said vessel mounted on the bottom wall of said boiler and extending upward in the boiler space above said boiler water and said boiler water heating means.

4,377,738

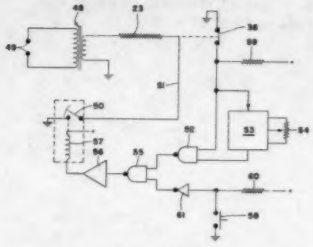
METHOD OF CONTROLLING THE TEMPERATURE OF AN ELECTRICALLY HEATED ELEMENT

Bernard J. Berg, Kentwood, Mich., assignor to Foresight Enterprises, Incorporated, Grand Rapids, Mich.

Continuation of Ser. No. 761,463, Jan. 22, 1977, abandoned. This application Feb. 8, 1979, Ser. No. 10,352

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—490 **4 Claims**



1. A method of controlling the temperature of an electrical resistance heating element comprising:

(a) applying current to said element until a predetermined threshold temperature of said element is reached;

(b) continuing the application of current to said element for a predetermined time period commencing at the time at which said element reaches said predetermined threshold temperature;

(c) upon termination of said time period, discontinuing current flow to said element until the temperature thereof falls below said predetermined threshold temperature; and

(d) repeating, in sequence, steps a, b and c.

4,377,739

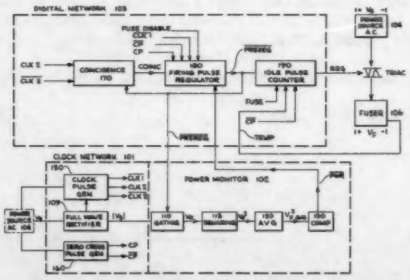
AVERAGE POWER CONTROL APPARATUS AND METHOD

Alton B. Eckert, Jr., Norwalk, and Wayne W. Pritchett, Newtown, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Continuation of Ser. No. 869,465, Jan. 16, 1978, abandoned. This application Jul. 6, 1979, Ser. No. 55,435

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—497 **2 Claims**



1. In an electrophotocopy machine adapted to be connected to a source of supply of ac power and including a fuser, apparatus for controlling the power supplied to the fuser, said power controlling apparatus comprising:

a. a gate interposed between the source and fuser and responsive to respective firing signals for gating power to the source;

b. a clock network including means for generating a zero-

crossing signal in response to each change of polarity of voltage of said source;

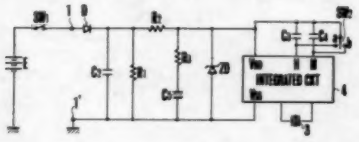
c. a fuser power monitoring network including means coupled to the source and fuser for generating a signal representing the average level of power gated to the source, said fuser power monitoring network including means for comparing said average power level to a desired level and generating a digital power request signal when the power level is not greater than said desired level; and

d. a digital network including a coincidence circuit coupled to the clock and power monitoring networks for controlling the polarity of half cycles of power gated to the fuser, the coincidence circuit including means for comparing respective half cycles of power gated to the fuser with respective half cycles available for gating and generating a coincidence signal when the polarity of the next half cycle of power is opposite to the last gated half cycle; and said digital network including a regulating circuit for controlling the number of opposite half cycles of power gated to the fuser, the regulating circuit responsive to the power request signal and responsive to respective coincidence signals for generating firing pulses to timely gate at least one of each successive three full half cycles of power to said fuser such that average power which is free of any dc signal component and not less than one-third of the available power is delivered to said fuser.

4,377,740
INITIALIZING CIRCUIT ARRANGEMENT FOR A COUNTER CIRCUIT

Kozo Uga, Kawasaki, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha; Nippondenso Co., Ltd., both of Toyota and Jeco Co., Ltd., Kawasaki, all of, Japan

Filed Jun. 23, 1980, Ser. No. 161,685
Claims priority, application Japan, Jun. 25, 1979, 54-87221
Int. Cl.³ G04B *27/00*
U.S. Cl. 377—2 **7 Claims**



1. An initializing circuit arrangement for a counter circuit comprising:

a power source providing operating voltage between ground and supply terminals switch-connected to an input line;

a plurality of counters each including an initializing terminal for setting its counter to a predetermined count in response to an initializing signal, each counter normally counting the number of external signals;

independent correction terminals for at least two of the plurality of counters each correction terminal connected to means for correcting its counter in response to a correction signal on its correction terminal;

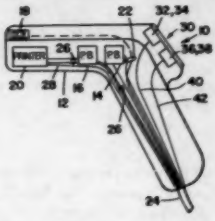
an initializing circuit connected between the initializing terminal of each of the counters and said correction terminals; and

an initializing signal generator means connected between said initializing circuit and said input line for generating said initializing signal upon connection to said power source.

4,377,741
APPARATUS FOR PRODUCING UPDATED INFORMATION ON A TANGIBLE MEDIUM

Thomas T. Brekka, Santa Cruz, and Frank F. Stucki, Portola Valley, both of Calif., assignors to The Brekka Corporation, Santa Cruz, Calif.

Filed Jun. 26, 1980, Ser. No. 163,317
Int. Cl.³ G06F *15/84*; G06K *7/12*
U.S. Cl. 235—472 **49 Claims**



1. Apparatus for producing updated information on a tangible medium having present data including present information, comprising:

(a) opto-electric means for acquiring the present data having the present information from the tangible medium;

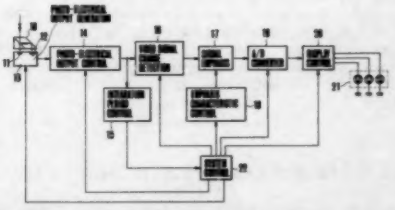
(b) data processing means for storing updated data having the updated information and for comparing the present data and the updated data to produce output information being the same as the updated information; and

(c) data transfer means, responsive to the output information, for transferring the updated information to the tangible medium.

4,377,742
IMAGE SHARPNESS DETECTING SYSTEM

Takashi Kawabata, Kamakura; Kazuya Hosoe, Machida; Nobuhiko Shinoda, Tokyo; Shinji Sakai, Tokyo, and Takao Kinoshita, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1980, Ser. No. 151,703
Claims priority, application Japan, May 23, 1979, 54-63377; May 23, 1979, 54-63378; May 23, 1979, 54-63379; May 23, 1979, 54-63380; May 23, 1979, 54-63381
Int. Cl.³ G01J *1/36*
U.S. Cl. 250—204 **86 Claims**



1. A system for detecting the sharpness of an image formed by an image forming optical means, comprising:

(A) image sensing means for sensing the image formed by said optical means, said image sensing means having an array of a plurality of radiation sensitive elements, the individual elements producing electrical signals corresponding to the radiations incident thereon, and said image sensing means having as its output to provide the electrical signals of the respective elements in a time-seriated manner;

(B) illuminance difference detecting means for providing electrical signals representing illuminance difference in the individual minute compartments of said image based on the output of said image sensing means;

(C) signal transforming means for non-linear transformation and absolute-value transformation of the electrical signals provided by said illuminance difference detecting means, said signal transforming means having at least one semiconductor element embodying signal non-linear transformation characteristics, whereby said electrical signals are at least non-linearly transformed by utilizing said semiconductor; and

(D) image sharpness output means for providing an output representing the sharpness of said image on said image sensing means based on the non-linearly transformed and absolute-value transformed electrical signals by said signal transforming means.

4,377,743

CIGARETTE ROD OPTICAL INSPECTION

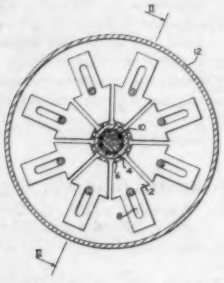
Reginald C. Bolt, High Wycombe, and John G. Dowding, Milton Keynes, both of England, assignors to Molins Limited, Bucks, England

Filed Oct. 9, 1980, Ser. No. 195,621

Claims priority, application United Kingdom, Oct. 12, 1979, 7935479

Int. Cl.³ G01V *9/04*

U.S. Cl. 250—223 R **16 Claims**



1. An inspection device for a continuous cigarette rod comprising means for guiding a continuous cigarette rod along a predetermined path extending through an inspection station and a plurality of optical units arranged at the inspection station at circumferentially spaced positions around the path of the rod, each optical unit comprising a light emitter and a light detector, means associated with the emitter for focussing the emitted light from that emitter and directing the focussed light at a respective area of a rod being inspected, and means associated with the detector for collecting light reflected from the said area of the rod and for directing the collected light to the detector.

4,377,744

REMOTE LENS FOCUSING SYSTEM FOR AN AERIAL CAMERA

Michael E. Mocenter, Erdenheim, and Harry F. Koper, Warminster, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 14, 1980, Ser. No. 168,854

Int. Cl.³ G01D *5/34*

U.S. Cl. 250—231 SE **7 Claims**

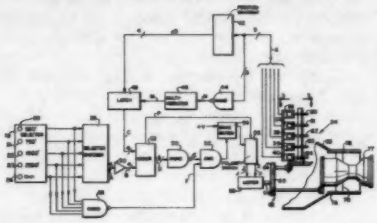
1. A remote lens focusing system comprising:

a positionable lens for incrementally varying the focal length thereof;

selector means having a plurality of switches each producing a first decimal number signal indicative of a selected slant range, a first encoder connected to receive and convert the first number signal into a first binary coded signal, an inverter connected to receive and invert the first coded signal into an inverted coded signal;

sensor means connected to said lens for producing a stored binary coded signal indicative of the incremental focal length;

controller means having a binary full adder connected to receive and add the inverted and stored coded signals for producing a binary coded sum signal indicative of a difference between the selected range and said lens focal length and a carry signal indicative of a rotational direction



command for positioning of said lens, a first NAND gate connected to receive the coded sum signal for providing a one-bit sum signal indicative of a difference between the selected range and the lens focal length, a second NAND gate connected to receive the first number signal for producing an inhibit signal indicative of the absence of range selection, an AND gate connected to receive the one-bit sum signal and inhibit signal for producing a drive signal indicative of a valid change position command; and

motor means connected to receive the drive signal and carry signal and operatively connected to said lens for providing positioning thereof.

4,377,745

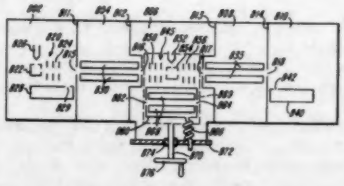
MASS SPECTROMETER FOR CHEMICAL IONIZATION, ELECTRON IMPACT IONIZATION AND MASS SPECTROMETRY/MASS SPECTROMETRY OPERATION

Cherng Chang, 3065 Maginn Dr., Xenia, Ohio 45385

Continuation-in-part of Ser. No. 965,255, Dec. 1, 1978, Pat. No. 4,266,127. This application Apr. 27, 1981, Ser. No. 257,938

Int. Cl.³ B01D *59/44*

U.S. Cl. 250—283 **22 Claims**



5. A method of chemical analysis using a quadrupole mass spectrometer having sample introduction means, chemical ionization reagent gas introduction means, ion generation means, ion source means, positive ion quadrupole analyzer means, negative ion quadrupole analyzer means, comprising the steps of:

A. generating positive ions and negative ions simultaneously within the ion source means through chemical ionization,

B. simultaneously extracting the positive ions and the negative ions formed in Step A from the ion source means, and simultaneously transmitting the extracted positive ions

and the extracted negative ions to the positive ion quadrupole analyzer means and the negative ion quadrupole analyzer means, respectively, for analysis.

4,377,746

DEVICE FOR DETECTING SURFACE FLAWS OF RAPIDLY MOVING SHEET MATERIAL

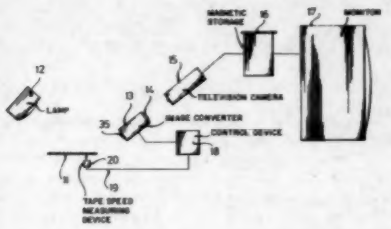
H. J. Kopineck, and Wilhelm Tappe, both of Dortmund, Fed. Rep. of Germany, assignors to Hoesch Werke Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Nov. 20, 1980, Ser. No. 208,819

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1979, 2952712

Int. Cl.³ G01N *23/00*; G01J *1/00*; G01N *21/84*

U.S. Cl. 250—359.1 **12 Claims**



1. Device for detecting surface flaws of rapidly moving sheet material, particularly of metal strip in rolling mills, comprising lens means for scanning the sheet material surface; a camera tube for converting optical images received by said lens means into electrical values; a magnetic storage connected with said camera tube to receive said electrical values therefrom; an image reproducing device connected with said storage to receive the stored values therefrom and convert them into a visible image; and at least one image amplifier tube means interposed between said lens means and camera tube and including an electronic speed shutter for interrupting plate voltage of said image amplifier tube means, said electronic speed shutter being built into said image amplifier tube means.

4,377,747

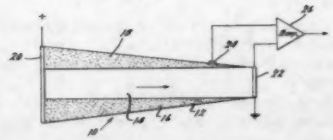
NON-UNIFORM THERMAL IMAGING DETECTOR

Bernard T. Smith, El Toro; Wayne T. Armstrong, Mission Viejo, and Richard D. Nelson, Santa Ana, all of Calif., assignors to Ford Aerospace and Communication Corporation, Detroit, Mich.

Filed Dec. 8, 1980, Ser. No. 214,310

Int. Cl.³ G01T *1/22*; H01J *31/49*

U.S. Cl. 250—370 **8 Claims**



1. In a thermal radiation image scanning system which employs means for scanning a thermal radiation image across a focal plane, an integrating detector for receiving said scanned radiation on an exposed surface thereof, wherein said integrating detector is an elongated strip of semiconductor material rendered photoconductive by the generation of electron and hole photocarriers when said radiation image is scanned along said strip, first and second biasing electrodes mounted on opposite ends of said strip and means for applying a D.C. biasing source to said first and second electrodes to produce a generally lengthwise D.C. electric current flow through said strip and thereby cause an ambipolar drift of photocarriers in said strip and at least one read out electrode on said strip located near the end of said strip to which said photocarriers are drifting, an improvement whereby said elongated detector strip is formed to have a constantly variable cross-section along its length of elongation thereby affecting the charge density of said drifting photocarriers along the length of said detector strip by the resultant variations in the electrical bias field density along said length.

4,377,748

X-RAY DIAGNOSTIC SYSTEM COMPRISING MEANS FOR THE FIXED SPECIFICATION OF EXPOSURE TIME, X-RAY TUBE VOLTAGE, AND MAS-PRODUCT

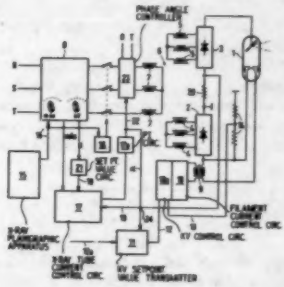
Horst Aichinger, Fuerth, and Gerd Seifert, Spardorf, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 22, 1980, Ser. No. 142,703

Claims priority, application Fed. Rep. of Germany, May 7, 1979, 2918353

Int. Cl.³ H05G *1/34*

U.S. Cl. 378—110 **7 Claims**



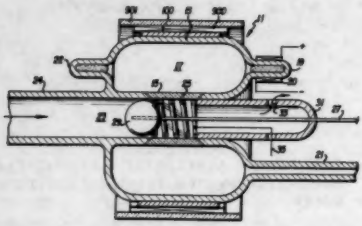
1. An x-ray diagnostic system comprising an x-ray tube for supplying x-ray energy at a film plane, supply means for supplying x-ray tube voltage to said x-ray tube, means for the fixed specification of the exposure time of an x-ray photograph, and adjustment means for selecting the x-ray tube voltage and the mAs-product, characterized in that an x-ray tube current control loop for controlling the x-ray tube current is present which controls the x-ray tube current on the basis of the fixed exposure time and the selected mAs-product, said x-ray tube current control loop comprising actual x-ray tube current sensing means for sensing the actual value of x-ray tube current, x-ray tube current setpoint means controlled in accordance with the fixed specification of the exposure time, and being operable in conjunction with the adjustment means for selecting mAs-product, to provide a corresponding setpoint value of x-ray tube current, and x-ray tube current control means for controlling the x-ray tube current and responsive to deviations of the actual x-ray tube current as sensed by said actual x-ray tube current sensing means, from the setpoint value of x-ray tube current as provided by said x-ray tube current setpoint means, to tend to maintain the actual value of x-ray tube current at said setpoint value, said supply means comprising a high voltage transformer (6) having a primary circuit, and said x-ray tube current control loop comprising a keying circuit (23) for controlling the x-ray tube current, arranged in the primary circuit of the high voltage transformer (7).

4,377,749

PHOTOIONIZER

Robert A. Young, 10658 Fullbright Ave., Chatsworth, Calif. 91311

Filed Feb. 25, 1981, Ser. No. 238,275
Int. Cl.³ H01J 39/34
U.S. Cl. 250—423 P 44 Claims



1. A photoionizer comprising

a light source comprising:

a hollow torus;

a UV or VUV transmitting window in said torus, said window comprising part of the inner wall of said torus;

a gas filling within said torus, said gas filling being at a pressure between 10^{-3} and 10^{3} torr;

means for creating an electrical discharge within said torus;

means for passing a preselected gas sample through the passage in said torus;

means within said passage through said torus for collecting or extracting the ions and electrons produced by the light from said light source striking said gas sample; and

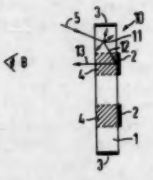
means connected to said means within said passage for measuring the ions and electrons collected by said electrode means.

4,377,750

PASSIVE DISPLAY DEVICE

Heinz Pape, Munich, and Ferdinand Quella, Gauting, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 4, 1980, Ser. No. 184,003
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1979, 2941313
Int. Cl.³ F21V 9/16
U.S. Cl. 250—458.1 12 Claims



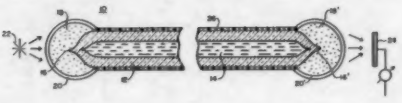
1. A passive display device particularly useful for signs and reflectors and not requiring any light source comprising means for entrapping light and emitting light at a given position at an increased intensity, said means including at least one transparent fluorescent member having an index of refraction n greater than 1 and containing fluorescent particles, said fluorescent particles collecting impinging light by fluorescent scattering with subsequent reflections on the boundary surface of said member; and output coupling zones being disposed on said member in a desired pattern for uncoupling light from the device at a concentrated intensity.

4,377,751

OPTICAL WAVEGUIDE DOSIMETER

Stanley Kronenberg, Skillman, N.J.; Harry Levine, Silver Spring, Md.; William L. McLaughlin, Washington, D.C., and Carl R. Siebentritt, McLean, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 28, 1981, Ser. No. 267,312
Int. Cl.³ G01N 5/00
U.S. Cl. 250—474.1 22 Claims



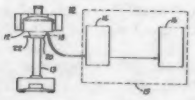
18. A device for sensing ionizing radiation comprising: radiation transparent tubing filled with a transparent radiochromic liquid, said liquid having a transparency which changes with the intensity of ionizing radiation, the refractive index of the liquid being greater than the refractive index of the transparent tubing, an outer tubing opaque to ultraviolet light over the transparent tubing, the ends of the transparent tubing being enclosed and sealed to retain said liquid, and a clear ultraviolet absorbing coating over the enclosed ends to provide a shield against ambient ultraviolet light.

4,377,752

SCINTILLATION CAMERA RADIATION SHIELDING

Richard M. Sano, Stamford; John W. Steidley, North Haven; Bruce M. Gillespie, New Haven, and Jack B. Tinkel, Durham, all of Conn., assignors to Picker Corporation, Cleveland, Ohio

Continuation of Ser. No. 917,071, Jun. 19, 1978, abandoned. This application Jan. 22, 1980, Ser. No. 114,380
Int. Cl.³ G21F 5/04
U.S. Cl. 378—152 14 Claims



1. In a gamma camera of the type having a detector including a receptor responsive to incident gamma radiation and circuitry for producing an image in a display, the improvement comprising:

(a) a collimator connected to the detector for selectively allowing incident radiation from a patient to reach the receptor;

(b) an apertured disc of radiation absorbing material functioning as a radiation attenuating device;

(c) attenuating device support structure connected to the detector and delineating a disc receiving and supporting gap; and,

(d) said disc being slidably positioned in the gap and movable in the gap across the camera field selectively to align the disc's aperture with a patient field of interest and to screen out and block the transmission of radiation emanating from locations without the field of interest to the

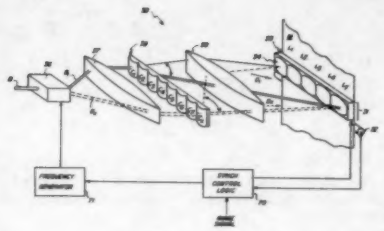
receptor whereby to decrease camera down time which would otherwise to occasioned by such radiation emanating from without this field of interest.

4,377,753

HIGH RESOLUTION OPTICAL-ADDRESSING DEVICE AND ELECTRONIC SCANNER AND/OR PRINTER APPARATUS EMPLOYING SUCH DEVICE

Jose M. Mir, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 1, 1981, Ser. No. 268,977
Int. Cl.³ H01J *40/14*
U.S. Cl. 250—578 **14 Claims**



1. A device for optically addressing a plurality of discrete, high-resolution pixel spots located at respective positions across a linear, optical-address region, said device comprising:

(a) a linear lens array including a plurality of discrete lens means each adapted to focus incident collimated light, from a plurality of different incidence directions, onto respectively different pixel spots of its associated, multi-spot address zone within said optical-address region; and

(b) control means for directing collimated light onto said linear lens array sequentially from different ones of a plurality of different incidence directions,

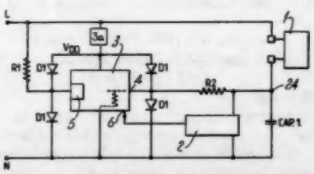
whereby different pixel spot sets, each including one pixel spot from each of the different zones of said optical-address region, will be optically addressed sequentially in response to such sequential light direction by said control means.

4,377,754

SWITCHING CIRCUIT FOR A REMOTE CONTROL SYSTEM

David R. Thompson, Ladybank, Scotland, assignor to Pico Electronics Limited, Glenrothes, Scotland

Filed Feb. 26, 1981, Ser. No. 238,166
Claims priority, application United Kingdom, Mar. 5, 1980, 8007568
Int. Cl.³ H01N *19/64*
U.S. Cl. 307—114 **12 Claims**



12. A circuit arrangement for coupling a switchable appliance to a power main, the arrangement comprising:

an input for connection to a power main;

an output for connection to a switchable appliance;

remotely controllable switching means coupling the input and output; and

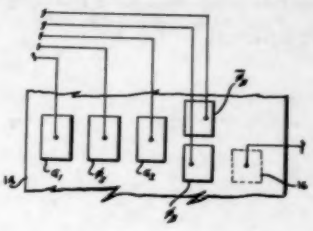
means responsive to changes in external impedance across said output, consequent upon switching the appliance off and then on within a predetermined time period, to cause said switching means to change state.

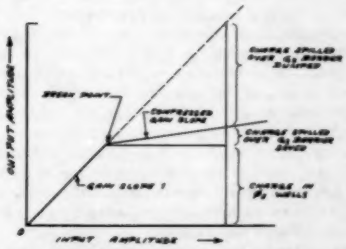
4,377,755

SIGNAL COMPRESSOR APPARATUS

William E. Jensen, San Pedro, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 15, 1980, Ser. No. 169,231
Int. Cl.³ G11C *19/28*; H01L *29/78*; H03K *3/42*
U.S. Cl. 377—63 **8 Claims**





1. In a charge transfer device, a charge coupled device which comprises a semiconductor substrate with an insulating material deposited thereon and a plurality of gate electrodes provided on or within said insulating material and driving means for driving said plurality of gate electrodes, the improvement comprising a signal compressor means for compressing an input signal wherein a first gate electrode means receives a first fixed bias from said driving means to provide a first potential barrier,

a second gate electrode means receives a voltage waveform with a predetermined linear slope from said driving means to provide a variable charge storage well,

a third gate electrode means receives a second fixed bias from said driving means to provide a second potential barrier, said second potential barrier being lower than said first potential barrier; and

a pair of adjacent gate electrodes next to said third gate electrode means to receive complementary clock pulses from said driving means, one of said pair of adjacent gate electrodes being an output gate which is connected to an output register, the other of said pair of adjacent gate electrodes being a dump gate which is connected to a dump diffusion means for dumping excess charge, said signal compressor means receiving an input charge with a linear charge rate, said input charge passing over said first potential barrier and into said storage well, the excess of said input charge passing over said second potential bar-

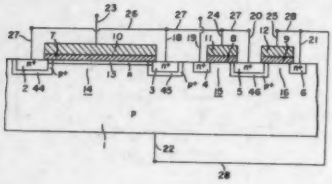
rier and through said dump gate electrode to said dump diffusion means during the intitial portion of the integration period, near the end of the integration period, said clock pulses to said pair of adjacent gate electrodes reverses and enables said output gate wherein any excess charge therein is combined with the charge in said storage well and applied to said output register.

4,377,756

SUBSTRATE BIAS CIRCUIT

Tsutomu Yoshihara; Kazuhiro Shimotori, and Yasuji Nagayama, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 12, 1980, Ser. No. 120,830
Claims priority, application Japan, Feb. 12, 1979, 54-14765
Int. Cl.³ H01L 29/78, 27/04
U.S. Cl. 307—296 R 1 Claim



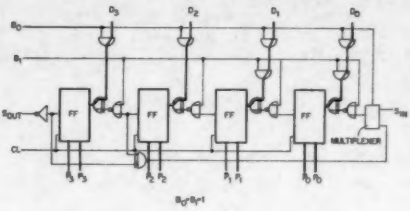
1. In a substrate bias circuit comprising a semiconductor substrate of a first conductivity; first, second, third, fourth and fifth semiconductor regions of a second conductivity which are formed with each space on a first main surface of said semiconductor substrate; a first gate conductive layer which is formed from said first semiconductor region to said second semiconductor region through a first gate insulating layer on the main surface of said semiconductor substrate; a second gate conductive layer which is formed from said third semiconductor region to said fourth semiconductor region through a second gate insulating layer on the main surface of said semiconductor substrate; a third gate conductive layer which is formed from said fourth semiconductor region to said fifth semiconductor region through a third gate insulating layer on the main surface of said semicoductor substrate; a first wiring line connecting said first semiconductor region to said second semiconductor region; a second wiring line connecting said first wiring line to said second gate conductive layer and said fourth semiconductor region; a third wiring line connecting said third gate conductive layer to said fifth semiconductor region and an electrode lead out from the second main surface of said semiconductor substrate; a field-effect capacitor formed by using said first and second semiconductor regions connected by said first wiring line as one electrode and using said first gate conductive layer as the other electrode, a first field-effect transistor formed by using said third semiconductor region as the source; using said fourth semiconductor region as the drain and using said second gate conductive layer as the gate, a second field-effect transistor formed by using said fourth semiconductor region as the source; using said fifth semiconductor region as the drain and using said third gate conductive layer as the gate; wherein a potential of said third semiconductor region is the earth potential and a potential of said semiconductor substrate is a negative potential under applying an AC signal to said first gate conductive layer; an improvement characterized in that first, second and third semiconductor regions of the first conductivity which have impurity concentrations higher than that of said semiconductor substrate are formed around the contact surfaces of said first, second and fourth semiconductor regions to said semiconductor substrate.

4,377,757

LOGIC MODULE FOR INTEGRATED DIGITAL CIRCUITS

Bernd Könemann; Joachim Mucha, and Günther Zwiehoff, all of Aachen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 11, 1980, Ser. No. 120,070
Int. Cl.³ H03K 3/335, 21/00
U.S. Cl. 307—303 7 Claims



1. A logic module for construction in an integrated digital circuit for promoting testing of the integrated circuit, comprising:

a plurality of interconnected basic cells, each of said basic cells being formed of a flip-flop connecting with a logic circuit comprised of a plurality of logic gates associated with each flip-flop, one of the logic gates of the logic circuit being an exclusive OR gate whose output connects to a data input of the corresponding flip-flop, the basic cells being interconnected in a chain through the logic gate circuits to form a logic module having a signal input, parallel data inputs connecting with the flip-flops through the logic gate circuits, at least one signal output derived from the flip-flops, first and second control signal lines connecting to the data inputs of the flip-flops through the associated logic gate circuits, a multiplexer connecting between at least one of the flip-flops and said signal input, and an exclusive OR gate also connecting to the multiplexer and an output of at least one of the other flip-flops so as to permit a back-coupling mode of operation; and said logic module forming a test logic module means which, depending upon signals applied to first and second control signal lines, operates in a normal mode as a latch with the parallel data inputs connected through by the logic gate circuits to the data inputs of flip-flops, in a linear shift register mode operates such that serial data are read in via the module signal input and from which data can be read out either serially via the signal output or in parallel via individual basic cell outputs, or in a back-coupled shift register mode operates such that data is rolled in from other basic cells via the multiplexer.

4,377,758

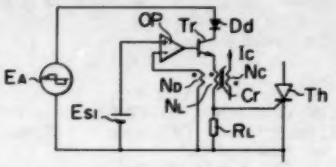
MAGNETIC AMPLIFYING APPARATUS

Hisakatsu Kiwaki, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 17, 1980, Ser. No. 160,202
Claims priority, application Japan, Jun. 22, 1979, 54-78167
Int. Cl.³ H03F 9/00
U.S. Cl. 307—417 17 Claims

1. A magnetic amplifying apparatus comprising a saturable magnetic core, a control winding wound on said magnetic core, an output winding wound on said magnetic core, power supply means for feeding a series connection including said output winding and a load to thereby produce an output from said output winding having a phase controlled in accordance with the impedance reduction of said output winding due to the saturation of said magnetic core, wherein means is further provided for suppressing the amount of electricity supplied

from said power supply means to said series connection during the non-saturation period of said magnetic core to a smaller



amount than during the saturation period of said magnetic core.

4,377,759

OFFSET COMPENSATING CIRCUIT

Michinobu Ohhata, Kawasaki; Toshihiko Matsumura, Yokohama; Masao Yamasawa, Sagamihara; Takafumi Chujo, Yokohama, and Masayuki Takahashi, Kawasaki, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

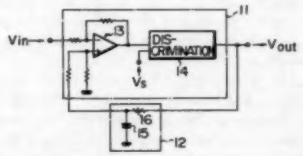
PCT No. PCT/JP80/00084, § 371 Date Dec. 25, 1980, § 102(e) Date Dec. 19, 1980, PCT Pub. No. WO80/02347, PCT Pub. Date Oct. 30, 1980

PCT Filed Apr. 23, 1980, Ser. No. 227,094

Claims priority, application Japan, Apr. 25, 1979, 54-50236; Jun. 4, 1979, 54-68802

Int. Cl.³ H03K *5/08*; H03F *1/34*

U.S. Cl. 307—491 **34 Claims**



1. An offset compensating circuit which is incorporated in a circuit to be compensated for an offset induced therein, comprising:

bipolar voltage generator means for producing either a positive reference voltage or a negative reference voltage in accordance with the polarity of an output signal produced from said circuit to be compensated; and

switched capacitor type integration circuit means for receiving said positive or negative reference voltage from said bipolar voltage generator means and producing an offset compensating voltage to be combined with an input signal to be applied to said circuit to be compensated in a negative feedback mode, wherein the switched capacitor type integration circuit means is comprised of a first capacitor acting as a sample-and-hold capacitor, an operational amplifier connected to a second capacitor acting as an integration capacitor, and switching means for alternately charging the first capacitor by said positive or negative reference voltage and transferring the charge of said first capacitor to said second capacitor.

4,377,760

DEVICE FOR READING A QUANTITY OF ELECTRIC CHARGE

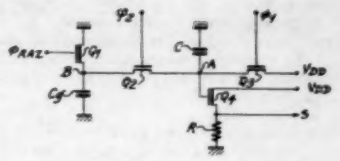
Roger Benoit-Gonin; Jean-Luc Berger; Sylvain Fontanes, and Jean-Edgar Picquendar, all of Paris, France, assignors to Thompson-CSF, Paris, France

Continuation of Ser. No. 902,046, May 2, 1978, abandoned. This application May 22, 1980, Ser. No. 152,350

Claims priority, application France, May 6, 1977, 77 13857

Int. Cl.³ H03K *5/19, 5/153*; G01R *19/00*; H03H *15/00*

U.S. Cl. 307—530 **8 Claims**



1. An analog device for reading a quantity of electric charge, which comprises:

(a) first (Q_2; FIG. 1) and second (Q_3) transistors which are connected in series to an arrival point for said quantity of charge, said first transistor, when conducting, operating in essentially a saturation mode, said second transistor, when conducting, operating in essentially a triode mode;

(b) a first capacitor (C) having two terminals, a first one of said terminals being connected to the common point (A) of said serially connected first and second transistors, and said second terminal is connected to an external voltage source;

(c) means for supplying a d.c. potential (V_{DD}) from an external source to said second transistor and in series with said transistors; and

(d) means (ϕ_2, ϕ_1) for alternately driving said first and second transistors (Q_2, Q_3) into conduction thereby to charge said first capacitor to a potential which approaches said d.c. potential, said capacitor maintaining said arrival point (B) at a constant potential even when said quantity of charge arrives, the arrival of said quantity of charge causing a corresponding change in the potential of said common point (A), said change comprising a read signal from said device; and wherein said alternately driving means (ϕ_2, ϕ_1) drives said first and second transistors into conduction for times which overlap for a quarter of a period the control signal for said second transistor.

4,377,761

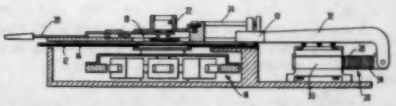
LINEAR STEPPER MOTOR DRIVE WITH A READ/WRITE HEAD IN A FLOPPY DISC SYSTEM

Leon J. Staciokas, Downingtown, Pa., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 872,617, Jan. 26, 1978, abandoned. This application Feb. 11, 1980, Ser. No. 120,267

Int. Cl.³ H02K *41/00*

U.S. Cl. 310—12 **2 Claims**



1. A drive for a magnetic data storage disc comprising:

a rotary drive means for rotating a magnetic data storage disc;

a read/write head for reading or writing data on the disc; and

linear drive means for linearly moving said head along a radial path across said disc, said linear drive means comprising a linear stepper motor of the variable reluctance type including:

a stationary magnetic structure;

a sliding magnetic structure; and

bearing means for supporting said sliding structure on said stationary structure;

said stationary structure including a plurality of pole positions having windings associated therewith and adapted to be energized in various phases so as to produce linear motion of said slider through a plurality of magnetically inherent step positions;

said sliding structure comprising magnetic material having a plurality of magnetic discontinuities therein, the overall length of said plurality of discontinuities along said structure being longer than said stationary magnetic structure;

said sliding structure and said stationary structure further forming a pair of bearing raceways, each of said raceways having closed ends and being centrally located on a pair of opposite sides of said sliding structure;

said bearing means being confined in said pair of raceways, each of said pair of raceways being formed by juxtaposed grooves on adjoining faces of said sliding structure and said stationary structure, each of said grooves including a pair of raised surfaces extending in the direction of linear motion of said sliding member, wherein said bearing means comprises balls riding on the two pairs of raised surfaces in each of said raceways;

said stationary structure including means for adjusting the friction on said ball bearings in said raceways.

4,377,762

ROTARY ELECTRIC MACHINE ROTOR AND A METHOD OF MANUFACTURING THE SAME

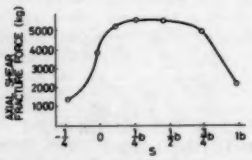
Hideo Tatsumi; Hisanobu Kanamaru; Akira Tohkairin; Moisei Okabe, and Ryoji Kasama, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 125,094, Feb. 27, 1980. This application Jan. 7, 1981, Ser. No. 223,151

Claims priority, application Japan, Jan. 7, 1980, 55-114

Int. Cl.³ H02K *15/02*

U.S. Cl. 310—42 **7 Claims**



1. A rotor of a rotary electric machine comprising:

a rotary shaft having a circumferential surface with at least one annular groove therein and a plurality of axially extending protuberances thereon; and

a rotor core having an aperture for receiving said rotary shaft therein;

wherein the rotary shaft is press-fit within said aperture of the rotor core with said annular groove being positioned slightly inside of an end face of said rotary core, and wherein a portion of said end face near said shaft has been cold-pressed, while a preload has been exerted on the remaining portion of said end face, in a manner such that the rotor core and rotary shaft are fastened together by a portion of said rotor core having been plastically deformed into said annular groove in the rotary shaft filling same, and a recessed portion is formed in said end face which satisfies the following relationship relative to the annular groove: $0 \leqq s/b \leqq \frac{1}{4}$, wherein s denotes the distance from the bottom of the recessed portion in the end face to the groove, and b denotes the width from the circumference of said rotary shaft to the outer circumferential end of the recessed portion.

4,377,763

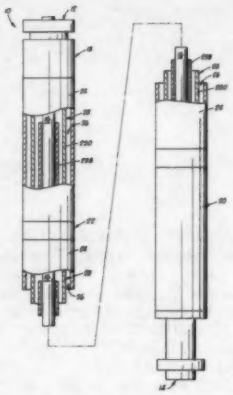
SEAL SECTION FOR A DOWNHOLE PUMPING UNIT

Eldon L. Drake, Shawnee, Okla., assignor to Western Technology, Inc., Shawnee, Okla.

Filed Mar. 19, 1981, Ser. No. 245,615

Int. Cl.³ H02K *5/12*

U.S. Cl. 310—87 **5 Claims**



1. A seal section for a downhole well pumping apparatus of the type having an oil filled motor drivingly connected to a pump via a shaft passing through the seal section, comprising:

a plurality of vertically spaced seal heads between the motor and pump, each seal head having a bore formed therethrough for passage of the shaft therethrough and each seal head having bearing means rotationally supporting the shaft;

a plurality of tubular casing members interconnecting the seal heads and forming therewith a plurality of vertically stacked, annular compartments centered on the shaft; and

a plurality of balance chamber forming assemblies, each assembly disposed in one of the compartments and comprising:

a tubular balance chamber outer wall member, connected solely to the uppermost of the two seal heads delimiting the compartment wherein the balance chamber outer wall member is disposed, each balance chamber outer wall member extending downwardly from such uppermost seal head in a concentric relation to the casing member thereabout to terminate in a free end positioned in a non-engaging relation with the lowermost seal head delimiting the compartment wherein the balance chamber outer wall member is disposed; and

a tubular balance chamber inner wall member, connected solely to the lowermost of the two seal heads delimiting the compartment wherein the balance chamber inner wall member is disposed, each balance chamber inner wall member extending upwardly from such lowermost seal head inside the balance chamber outer wall member disposed therewith in such compartment and concentric with such balance chamber outer wall member to terminate in a free end positioned in non-engaging relation with the upper seal head delimiting the compartment

wherein the balance chamber inner wall member is disposed;

wherein the uppermost of the seal heads is characterized as having means fluidly communicating portions of the bore therethrough near the upper end thereof with the exterior of the balance chamber outer wall member in the annular compartment therebelow; wherein the lowermost of the seal heads is characterized as having means fluidly communicating the interior of the motor with the interior of the balance chamber inner wall member in the annular compartment thereabove; wherein remaining seal heads are characterized as having means fluidly communicating the interior of the balance chamber inner wall member in the compartment thereabove with the exterior of the balance chamber outer wall member in the compartment therebelow; wherein each seal head above the lowermost thereof is characterized as having seal means for providing a fluid seal between the shaft and the bore therethrough; and wherein the shaft is supported in the passage thereof through the seal section solely by the bearing means disposed in the seal heads.

4,377,764

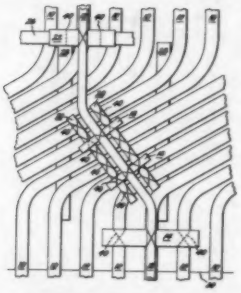
END WINDING SUPPORT FOR EXCITER WINDING BAR

Thomas R. Butman, Jr., Albany, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 178,867, Aug. 18, 1980, abandoned. This application Sep. 17, 1981, Ser. No. 302,963

Int. Cl.³ H02K *3/46*

U.S. Cl. 310—260 **11 Claims**



1. In a dynamoelectric machine including: a stator core having two opposed ends and a plurality of stator slots extending along a stator axis;

stator bars disposed in the stator slots and extending axially from one of said ends into an end winding region;

a "P" bar disposed in a predesignated stator slot occupied in part by a stator bar, said "P" bar also extending axially from said one end into said end winding region;

said end winding region having three sections including: an inner section close to said one end of said stator core wherein said "P" bar extends in a parallel direction to said stator bars;

an outer section near the farthest extremity of the stator bars and having a stator bar support means wherein said "P" bar again extends in a parallel direction to said stator bars and

an intermediate section between said inner section and said outer section, wherein said stator bars bend so that they lie tangentially in one direction about a frusto-conical surface of revolution concentric with said stator axis and said "P" bar bends in the opposite tangential direction about the surface of revolution, such that the "P" bar is positioned essentially perpendicular to the direction of the stator bars;

the improvement of a "P" bar end winding support system comprising:

(a) a main support bracket, located at said inner section, affixed to a first plurality of stator bars and attached to said "P" bar through a low friction interface between said bracket and said "P" bar such as to substantially restrain said "P" bar in the radial and circumferential directions and to provide a slip plane capable of accommodating relatively small differential thermal expansion displacements in the axial direction between said "P" bar and said stator bars;

(b) a pair of rails, each having a flat top surface and a flat bottom surface, located at said intermediate section affixed to a second plurality of stator bars in a direction substantially parallel to the direction of the "P" bar and spaced apart on either side thereof to form a track-like mounting base;

(c) a first end arm support bracket affixed to the top surfaces across one portion of said mounting base and affixed to said "P" bar;

(d) a second end arm support bracket affixed to the top surface across another portion of said mounting base and affixed to said "P" bar;

(e) an outboard support bracket affixed to the stator bar support means and affixed to said "P" bar.

4,377,765

MODE COUPLED TUNING FORK TYPE QUARTZ CRYSTAL VIBRATOR AND METHOD OF TUNING

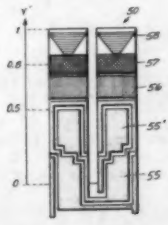
Shigeru Kogure; Eishi Momosaki, and Minoru Inoue, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Mar. 3, 1981, Ser. No. 240,045

Claims priority, application Japan, Mar. 4, 1980, 55-26958; Oct. 16, 1980, 55-144827

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—312 **33 Claims**



1. A mode coupled quartz crystal vibrator coupling two different modes of vibration, comprising:

a quartz crystal plate cut in the shape of a tuning fork having a base region, two coplanar tuning fork arms extending from the base for vibrating in a main vibrational mode and a different second vibrational mode and having excitation electrodes on the principal surfaces of said plate;

first adjust electrode means for adjusting the resonant frequency of the main vibration; and

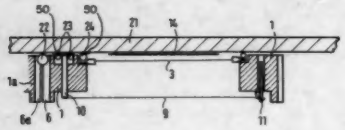
second adjust electrode means for adjusting the difference (Δf) between the resonant frequency of the main vibration and the resonant frequency of the sub-vibration for adjusting the frequency-temperature characteristics of the vibrator,

said first adjust and second adjust electrode means formed on the surface of the arms in the region near the top of the arms.

4,377,766
FRAME FOR UNIT MODULE OF A VACUUM-FLUORESCENT DISPLAY

Hartmut Lenz, Neuenbürg, and Helmut Thaler, Dettingen, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, NY

Filed Sep. 5, 1980, Ser. No. 184,603
Int. Cl.³ H01J *1/16, 19/10*; H01K *19/10*
U.S. Cl. 313—244 **13 Claims**



1. A substantially self-supporting, flat frame member for mounting a cathode and a control grid to form a unit module for a vacuum-fluorescent display, the frame member including leg means comprising an open frame for surrounding all but a portion of the periphery of the control grid and also including attachment means for securing the frame member to a second, substantially identical frame member of an adjacent unit module such that said open frame is closed by the leg means of the second frame member to construct a multi-character display wherein the control grid is completely surrounded by leg means.

7. A unit module for a vacuum-fluorescent display, the unit module comprising a self-supporting C-shaped frame, having two legs connected by an upright portion, a cathode, and a parallelogram-shaped control grid wherein:

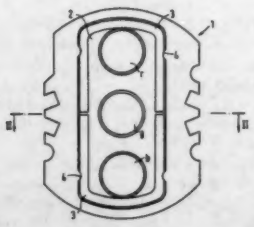
said C-shaped frame includes cathode mounting means for securing said cathode to said frame, first control grid mounting means for securing three sides of said control grid to said legs and upright portion of said frame, second control grid mounting means in said upright portion for securing to said frame the fourth, unsecured side of a control grid secured in a substantially identical, second unit module adjacent to said unit module and attachment means for securing said frame to the frame member of an adjacent unit module; and

said control grid includes interframe mounting means for securing the fourth, unsecured side thereof to an adjacent frame element.

4,377,767
DEVICE FOR ADJUSTING THE ELECTRON BEAMS OF A COLOR-PICTURE TUBE

Walter Kornaker, Berkheim, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 31, 1980, Ser. No. 221,586
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1980, 3003197
Int. Cl.³ H01J *29/50*
U.S. Cl. 313—412 **9 Claims**

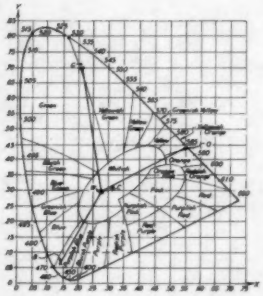


1. A device for adjusting the convergence, purity and raster of a color-picture tube having an electron-gun system disposed in its neck and producing three coplanar electron beams which device comprises elongated means attached to the electron-gun system which is magnetizable from outside, wherein said means is closed except for at least one air gap, said means encloses a non-circular area perpendicular to the electron-beam plane and symmetrical about the point where the central electron beam passes through said area, and said area has a long axis lying in the electron-beam plane and a short axis perpendicular thereto.

4,377,768
DATA DISPLAY CRT HAVING A WHITE-EMITTING SCREEN

Anthony V. Gallaro, Auburn, and Robert A. Hedler, Seneca Falls, both of N.Y., assignors to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Jun. 11, 1981, Ser. No. 272,608
Int. Cl.³ H01J *29/10*
U.S. Cl. 313—467 **8 Claims**



1. A monochrome data display cathode ray tube having means for forming and directing an electron beam to impinge a cathodoluminescent screen evidencing medium-long image persistence disposed in the viewing area, such being constituted of a bright white-emitting screen component substantially defined by C.I.E. color coordinates having an "x" value in the order of 0.275±0.015 and a "y" value in the order of 0.295±0.010 and exhibiting a nominal color temperature in the order of 10,600° K. (+18 MPCD), at substantially 15 KV, 50 ua excitation, said white-emitting screen component being formed of a discrete blend of phosphors comprising:

a medium-long persistence green-emitting phosphor evidencing an excited hue substantially defined by C.I.E. color coordinates having an "x" value in the order of 0.210±0.010 and a "y" value in the order of 0.700±0.010;

a medium-long persistence orange-emitting phosphor evidencing an excited hue substantially defined by C.I.E. color coordinates having an "x" value in the order of 0.550±0.010 and a "y" value in the order of 0.440±0.010; and

a medium persistence blue-emitting phosphor exhibiting an excited hue substantially defined by C.I.E. color coordinates having an "x" value in the order of 0.145±0.010 and a "y" value in the order of 0.060±0.005.

4,377,769

CATHODOLUMINESCENT DISPLAY DEVICE INCLUDING CONDUCTIVE OR SEMICONDUCTIVE COATING ON THE PHOSPHOR

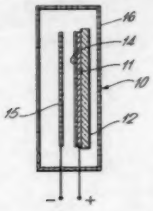
Paul H. J. Beatty, and Bernard R. Venn, both of London, England, assignors to Smiths Industries Public Limited Company, London, England

Filed Sep. 19, 1979, Ser. No. 77,060

Claims priority, application United Kingdom, Sep. 27, 1978, 38336/78

Int. Cl.³ H01J 29/20

U.S. Cl. 313—495 29 Claims



1. A cathodoluminescent display device having means for generating low-velocity electrons with an excitation potential of about 10 to about 100 electron volts and a cathodoluminescent layer which is to emit light in response to excitation thereof by said low-velocity electrons, in which said cathodoluminescent layer comprises particles of a phosphor material having a coating of a material selected from the group of an electrically conductive or semi-conductive material to increase the surface conductivity of said particles, said coating permitting the passage of electrons at said low velocity to excite said phosphor particles.

4,377,770

MICROWAVE DELAY LINE INCORPORATING A CONDUCTOR WITH A VARIABLE CROSS-SECTION FOR A TRAVELLING-WAVE TUBE

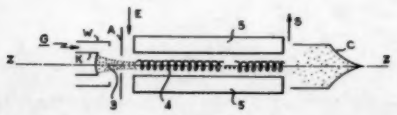
Georges Fleury, Paris, France, assignor to Thompson-CSF, Paris, France

Filed May 22, 1980, Ser. No. 152,173

Claims priority, application France, May 23, 1979, 79 13198

Int. Cl.³ H01J 25/34

U.S. Cl. 315—3.6 8 Claims



1. A travelling-wave tube comprising in a vacuum envelope; an electron gun for producing an electron beam; a delay line substantially co-axial with the electron beam for propagating a microwave interacting with said beam between an input and output of the tube, said delay line comprising a substantially helical shaped conductor, the cross section of which is greater at the output end of the helix than at the input end, and the increase occurs gradually with the turns closer to the output wherein the output turns are equal to or larger than the preceding turns, and with at least one fourth of the turns of the helix being greater in cross-section than those of the smallest turns.

4,377,771

GLOW-DISCHARGE STARTER

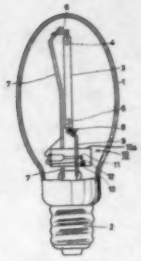
Johannes A. J. M. van Vliet, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 13, 1981, Ser. No. 253,429

Claims priority, application Netherlands, May 20, 1980, 8002891

Int. Cl.³ H01J 7/44

U.S. Cl. 315—047 6 Claims



1. A glow-discharge starter comprising a bimetallic electrode and a counter electrode and at least a rare gas, characterized in that the glow-discharge starter comprises a reversible getter which, when the temperature increases, gives off a gas and, when the temperature decreases, absorbs said gas and an increase of the pressure of said gas results in a smaller electric conductivity of the glow-discharge starter.

4,377,772

DISCHARGE LAMP AND LIGHTING EQUIPMENT

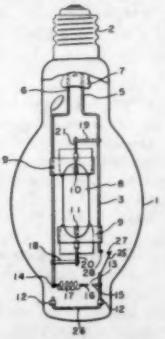
Michihiro Tsuchihashi; Ryo Suzuki; Keiji Watanabe, and Masato Saito, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1980, Ser. No. 201,914

Claims priority, application Japan, Nov. 28, 1979, 54-164788[U]; Dec. 27, 1979, 54-170769; Dec. 27, 1979, 54-170770

Int. Cl.³ H01J 7/44

U.S. Cl. 315—63 24 Claims



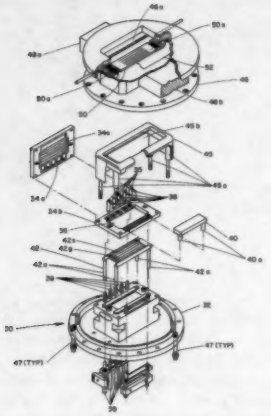
1. A discharge lamp which comprises an arc tube for high pressure discharge and a discharge gap for discharging until restarting said arc tube and said discharge gap being electrically connected in parallel to said arc tube in an outer bulb wherein mercury is kept in said outer bulb and a phosphor is coated on an inner surface of said outer bulb.

4,377,773

NEGATIVE ION SOURCE WITH HOLLOW CATHODE DISCHARGE PLASMA

Ady Hershcovitch, Mt. Sinai, and Krsto Prelec, Setauket, both of N.Y., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Dec. 12, 1980, Ser. No. 215,770
Int. Cl.³ H01J *27/02*
U.S. Cl. 315—111.81 **10 Claims**



1. A negative ion source comprising:
(a) an anode having an interior space for containing a plasma, and an opening into said space, said anode being at a first higher electrical potential;
(b) converter means within said space for converting positive ions and neutral particles into negative ions, said converter being at a second lower potential;
(c) a hollow cathode within said space for discharging a plasma into said space, said hollow cathode being at a third intermediate potential;
(d) means for initiating a discharge within said space so as to initially form said plasma;
(e) means for forming a magnetic field within said space, such field being oriented so that electrons in the plasma are restrained within said space while negative ions are preferentially allowed to pass through said opening; and
(f) means for extracting negative ions formed on said converter from said space through said opening.

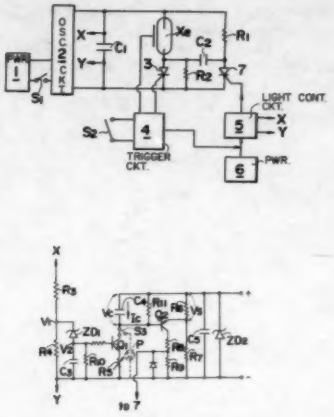
4,377,774

ELECTRONIC FLASH CONTROL DEVICE

Hiroshi Hosomizu, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 839,188, Oct. 4, 1977, abandoned. This application Mar. 13, 1980, Ser. No. 129,996
Claims priority, application Japan, Oct. 15, 1976, 51-124103
Int. Cl.³ H05B *41/32*
U.S. Cl. 315—241 P **6 Claims**

1. An electronic flash device which is equipped with an electronic flash tube capable of emitting light due to discharge of a main capacitor, comprising:
means for storing a signal corresponding to a potential in said main capacitor at a time before the emission of light from said electronic flash tube;
a current supply circuit for supplying a current commensurate with the stored signal, simultaneously with the starting of emission of light from said electronic flash tube, the current level being proportional to the potential of said main capacitor but substantially independent of the emitted light;
an integrating capacitor for integrating the current from said current supply circuit; and
a control circuit for interrupting the emission of light from



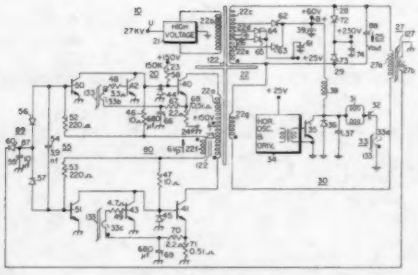
said electronic flash tube when the charge potential on said integrating capacitor reaches a given level to maintain the total amount of light emitted from said flash tube constant with different potentials of said main capacitor.

4,377,775

TELEVISION RECEIVER FERRORESONANT POWER SUPPLY DISABLING CIRCUIT

Donald H. Willis, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 29, 1981, Ser. No. 287,968
Int. Cl.³ H01J *29/70*
U.S. Cl. 315—411 **23 Claims**



1. A television display system that includes a ferroresonant power supply with a protection circuit for disabling normal operation of a load circuit within said television display system during a fault operating condition, comprising:
a source of alternating input voltage;
a magnetizable core including a saturable core section;
means coupled to said source for developing an exciting current that generates a magnetic flux in said magnetizable core that links said winding to produce an alternating polarity output voltage;
a capacitance associated with said winding for aiding in the magnetic saturation of said saturable core section during each cycle of said alternating polarity output voltage to regulate said output voltage by ferroresonant operation;

a load circuit within said television display system that is energized by said regulated alternating polarity output voltage;

means for detecting a fault operating condition within said television display system; and

means coupled to said detecting means and to said source of alternating input voltage and responsive to the detection of a fault operating condition for changing the operation of said source of alternating input voltage to one that results in said ferroresonant power supply being operated in a mode that is incapable of sustaining ferroresonance in order to disable operation of said television display system load circuit.

4,377,776

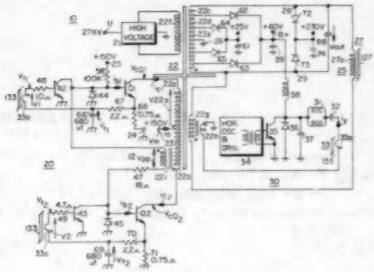
DUTY-CYCLE CONTROLLED INVERTER POWER SUPPLY FOR A TELEVISION RECEIVER

David W. Luz, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 29, 1981, Ser. No. 288,237

Int. Cl.³ H01J 29/70

U.S. Cl. 315—411 **18 Claims**



1. A television receiver, inverter power supply with duty-cycle control, comprising:

a deflection winding;

a deflection generator for developing scanning current in said deflection winding;

a source of direct voltage;

a power transformer including a primary winding and a supply winding;

controllable switching means having a main current path coupled to said source and to said primary winding so that on-off switching of the conduction in said main current path develops an alternating polarity voltage across said primary winding, thereby developing a supply voltage across said supply winding;

control means coupled to said switching means for producing said on-off switching at a nominal duty cycle of a predetermined percentage, including a synchronizing transformer with a first winding that has said deflection current flowing therein to magnetically saturate the core of said synchronizing transformer during the entirety of each deflection cycle except during intervals within each deflection cycle that encompass the zero-crossover instants of the deflection current to develop across a second winding of said synchronizing transformer switching signals for said controllable switching means so as to synchronize the zero-crossover instants of said power transformer alternating polarity voltage to corresponding zero-crossover instants of said deflection current;

means for developing a control signal that differs with different duty-cycle percentages of said on-off switching; and

means coupled to said control means and responsive to said control signal for adjusting the duty cycle of said on-off switching so as to oppose changes in said duty cycle away from the nominal percentage.

4,377,777

SWITCHING DRIVE CIRCUIT

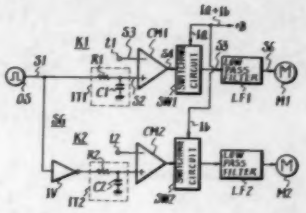
Osamu Asagi, Ebina, and Masaaki Sakai, Kawasaki, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 15, 1980, Ser. No. 178,369

Claims priority, application Japan, Aug. 16, 1979, 54-104221

Int. Cl.³ H02P 5/46

U.S. Cl. 318—68 **2 Claims**



1. A video tape recorder motor drive system, comprising:

a video tape recorder having means for processing television signals on a magnetic tape and including a drum motor and a capstan motor for driving the tape;

first and second switching circuit means for respectively applying power to the drum and capstan motors;

a common dc power source connected to supply power to the first and second switching circuits to be switched through to the respective drum and capstan motors;

first and second pulse width modulator circuit means respectively connected to the first and second switching circuits for providing a square wave drive signal of a variable duty cycle;

a signal generator means for producing a signal to be fed to the pulse width modulator circuits, the signal generator having a frequency corresponding to a horizontal frequency of the television signals associated with the video tape; and

means for providing a 180° phase difference for signals from the signal generator fed to the second pulse width modulator circuit relative to the first pulse width modulator circuit such that the "on" period for the first switching circuit has a 180° phase difference relative to an "on" period of the second switching circuit.

4,377,778

SEWING MACHINE SPEED CONTROL SYSTEM HAVING QUICK RESPONSE CHARACTERISTIC

Shigeo Neki, Osaka; Nozomu Shinozaki, and Takashi Dohi, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Oct. 23, 1980, Ser. No. 199,705

Claims priority, application Japan, Oct. 26, 1979, 54-139073

Int. Cl.³ H02P 5/16

U.S. Cl. 318—341 **10 Claims**

1. A closed-loop speed control system for controlling the speed of a moving object at a constant speed under varying loading condition, comprising:

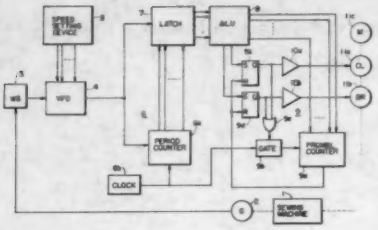
an accelerating means for coupling the motive power of a prime mover to said moving object and a decelerating means for decelerating said moving object;

a tachogenerator means for generating pulses at a frequency proportional to the speed of the moving object,

a counter means for measuring the interval between successive pulses generated by said tachogenerator means,

a digital translating means coupled to said counter means for translating each measured interval according to a prede-

termined transfer function describing the relationship between the measured interval and a duration in which said moving object is to be subsequently accelerated or decelerated and for generating a first output signal in accordance with said transfer function when said measured interval is greater than a predetermined value corresponding to said constant speed and a second output signal when said measured interval is smaller than said predetermined value, and



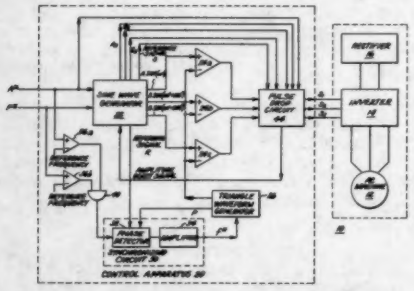
means for respectively converting said first and second output signals into first and second speed control pulses of said duration for application to said accelerating means and said decelerating means, respectively.

4,377,779

PULSE WIDTH MODULATED INVERTER MACHINE DRIVE

Allan B. Plunkett, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,553
Int. Cl.³ H02P 5/40
U.S. Cl. 318—811 **6 Claims**



1. For use with an inverter-machine drive system including of a direct current power supply, an n phase alternating current machine and an inverter coupled between said direct current power supply and said n phase alternating current machine, said inverter configured of n pairs of serially coupled switching devices, each of said n pair of switching devices, coupled across the output of said direct current power supply and coupled at the junction between each pair of serial switching devices to a respective one of the n phases of said machine, a control apparatus for supplying said inverter with switching signals, said control apparatus comprising:

waveform generator means for generating a first waveform signal responsive to an amplitude and a frequency command and for generating a reference waveform signal synchronized with said first waveform signal having a frequency a predetermined multiple of three times the first waveform signal frequency;

first comparing means for comparing said reference waveform with said first waveform to generate pulse width modulated signals;

controllable gate means receiving said PWM signals and when not disabled connecting said PWM signals to said inverter;

means for determining which, if any, of the pulse width modulated pulses at the commanded amplitude will be narrower than a predetermined width, said means having;

second comparing means for comparing said commanded amplitude to a plurality of fixed reference values; and

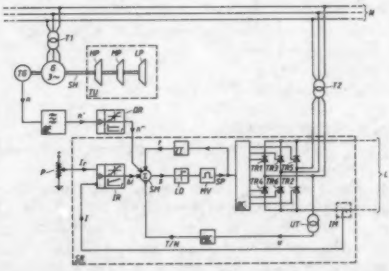
timing means receiving said reference signal and the output from said comparing means for disabling said controllable gate means during intervals of said reference signal when pulses narrower than a predetermined width would occur.

4,377,780

MEANS FOR DAMPING MECHANICAL TORSIONAL OSCILLATIONS OF AN ELECTRIC A.C. GENERATOR

Hans Björklund, Ludvika, Sweden, assignor to ASEA Aktiebolag, Västeras, Sweden

Filed May 27, 1980, Ser. No. 153,656
Claims priority, application Sweden, Jun. 6, 1979, 7904913
Int. Cl.³ H02J 3/36; H02H 7/06; H02P 9/00
U.S. Cl. 322—29 **7 Claims**

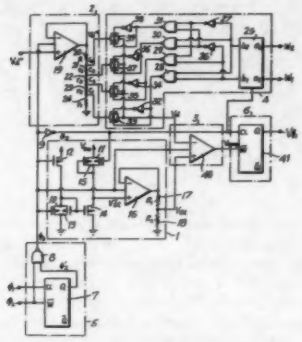


1. A high voltage direct current power transmission apparatus comprising a static convertor having d.c. terminals for connection to a d.c. network and a.c. terminals for connection to an a.c. network, said a.c. network comprising an electric a.c. generator, said converter being arranged for transmitting power between said a.c. and d.c. networks, said convertor having current regulator means for controlling the convertor current in accordance with a reference signal supplied to said current regulator means, control means for inflluencing the control angle of the convertor and having an input connected to an output of said current regulator means, sensing means for forming a signal which corresponds to speed variations of the generator with a frequency corresponding to a natural frequency of torsional oscillations of the generator, and means for supplying said signal to said control means so as to influence directly the control angle of the convertor and thereby the active power of the convertor for damping the oscillations.

4,377,781
SELECTIVELY ADJUSTABLE VOLTAGE DETECTION INTEGRATED CIRCUIT

Asakawa Tatsushi, and Morozumi Shinji, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation of Ser. No. 900,214, Apr. 26, 1978, Pat. No. 4,258,310. This application May 16, 1980, Ser. No. 150,485
Claims priority, application Japan, Apr. 26, 1977, 52-48290; Apr. 26, 1977, 52-48291
The portion of the term of this patent subsequent to Mar. 24, 1998, has been disclaimed.
Int. Cl.³ G05F 3/20
U.S. Cl. 323—299 10 Claims



1. In a voltage detection circuit, the improvement comprising a source voltage, a reference voltage circuit means for receiving said source voltage, said reference voltage circuit means including at least first and second pairs of complementary coupled P-channel and N-channel MOS transistors, said P-channel transistor in said first pair being coupled in series with said N-channel transistor in said first pair, said P-channel transistor in said second pair being coupled in series with said N-channel transistor in said second pair, at least one of said transistors in said first pair of complementary coupled P-channel and N-channel transistors having a different threshold voltage than the like polarity transistor in the second pair of complementary coupled P-channel and N-channel transistors, said reference voltage circuit means defining at least a first predetermined voltage having a magnitude that is related to the difference in threshold voltages between said respective like polarity transistors in said first and second pairs, said predetermined voltage being substantially independent of variations in temperature and minor variations in said source voltage, said reference voltage circuit means producing a set reference output voltage at said predetermined voltage in response to said source voltage.

4,377,782
FAULT LOCATION METHODS AND APPARATUS USING CURRENT PULSE INJECTION

Eric Metcalf, Ropley; Jack Woollven, Hawley; Stephen N. Spens, Farnham, and Brian L. A. Kett, Lower Parkstone, all of England, assignors to Membrain Limited, Wimborne, England

Filed Jun. 20, 1980, Ser. No. 161,485
Claims priority, application United Kingdom, Jun. 23, 1979, 7921940
Int. Cl.³ G01R 31/08, 31/28
U.S. Cl. 324—52 10 Claims

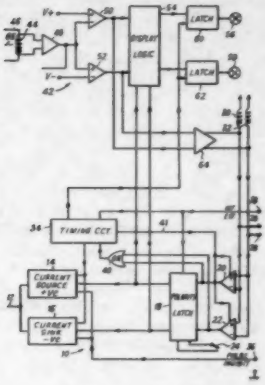
5. Apparatus for testing a powered electronic circuit, the apparatus comprising:

means for applying a sequence of test signals to said circuit;

means for storing, in response to the detection of a fault in said circuit during the application of said sequence of test signals, the number of the step in said sequence at which the fault occurred;

triggerable means for applying a current pulse of predetermined sense to a conductor of the circuit associated with the fault;

triggering means responsive to said test signal applying means and said storing means and coupled to the current pulse applying means to trigger the application of such a



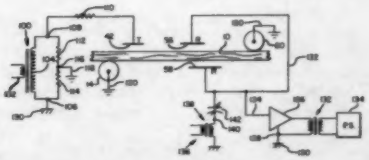
pulse when said sequence, during a subsequent application thereof to the circuit, reaches the step whose number was stored; and

means responsive to said triggering means and arranged to determine the direction of flow of said current pulse along the conductor, whereby to permit the determination of the direction of the fault with respect to the point on the conductor at which the pulse is applied.

4,377,783
MOISTURE DETECTOR

Delmer W. Wagner, 392 Pine Grove Rd., R.R., Rogue River, Oreg. 97537

Continuation of Ser. No. 84,881, Oct. 15, 1979, which is a continuation-in-part of Ser. No. 25,768, Apr. 2, 1979, abandoned. This application Jul. 17, 1981, Ser. No. 284,358
Int. Cl.³ G01R 27/26
U.S. Cl. 324—61 R 42 Claims



25. Apparatus for detecting the moisture content of material comprising:

a conductive conveyor for receiving said material and transporting the same in a first direction,

energizing means for providing a signal voltage difference between a first potential point and a second potential point with respect to said first potential point,

means for connecting said conductive conveyor to said second potential point to provide a signal path to moisture in said material received and transported by said conveyor,

conductive receiving plate means disposed in spaced facing

relation to said material on said conveyor for providing capacitive coupling to moisture in said material,

and a detector circuit for indicating moisture in said material, said detector circuit receiving an input from moisture in said material via said receiving plate means, said detector circuit being returned to said first potential point as a reference.

4,377,784

FAULT DETECTION APPARATUS FOR ROTOR WINDING OF ROTARY MACHINE

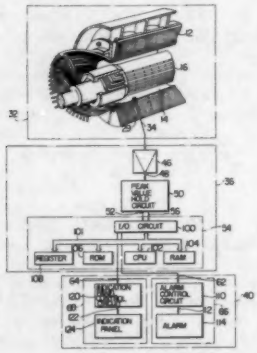
Toshio Saito; Motoya Ito; Noriyoshi Takahashi, and Masaki Sato, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 10, 1980, Ser. No. 215,065

Claims priority, application Japan, Dec. 12, 1979, 54-160385

Int. Cl.³ G01R *31/02*

U.S. Cl. 324—158 MG **9 Claims**



1. A fault detection apparatus for a rotor winding of a rotary machine comprising;

a magnetic flux sensor mounted in proximity to a surface of a rotor having said rotor winding wound thereon, said rotor being mounted in a stator of said rotary machine while leaning an air gap therebetween, said magnetic flux sensor sensing a leakage flux of said rotor winding in each slot of said rotor,

a peak value hold circuit for detecting peak values of a pulsing waveform of the signal supplied from said magnetic flux sensor, holding said peak values for a predetermined time period and then resetting the held value,

a register for storing past peak values,

a peak value processor for comparing the peak value held in said peak value hold circuit with the corresponding one of the peak values stored in said register, and

a monitor for indicating a fault in said rotor winding,

said processor determining the presence or absence of the fault in said rotor winding based on a result of the comparison of the corresponding peak values and applying a signal indicative of the fault to said monitor when the fault is determined.

4,377,785

DEVICE FOR DIAGNOSING IGNITION SYSTEM FOR USE IN INTERNAL COMBUSTION ENGINE

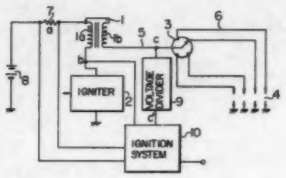
Yoshiki Ueno, Aichi; Takakazu Kawabata, Toyota; Tadashi Hattori, and Kazuhiko Miura, both of Okazaki, all of Japan, assignors to Nippon Soken, Inc. and Toyota Jidosha Kogyo Kabushiki Kaisha, both of Nishio, Japan

Filed Jul. 2, 1980, Ser. No. 166,094

Claims priority, application Japan, Jul. 6, 1979, 54-86088; Jul. 10, 1979, 54-87883; Jul. 20, 1979, 54-92752

Int. Cl.³ F02P *17/00*

U.S. Cl. 324—378 **8 Claims**



1. An ignition system for an internal ignition engine comprising a secondary voltage rising slope measuring circuit for measuring the slope of rising of the secondary voltage produced in an ignition coil, a primary cutoff current measuring circuit for measuring the primary current in the primary coil of said ignition coil immediately before said primary current is cutoff, and a calculating circuit for producing an output representing the floating capacitance present in the ignition system from said slope measured by said secondary voltage rising slope and said primary cutoff current measured by said primary cutoff current measuring circuit and for producing an output representing the secondary voltage.

4,377,786

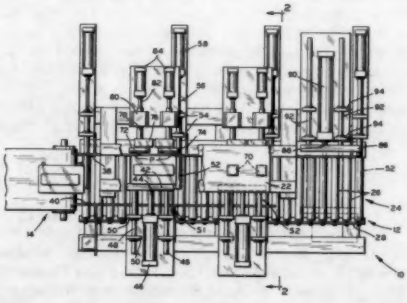
BATTERY TESTING APPARATUS

William A. Paul, and James A. Paul, both of Toledo, Ohio, assignors to Radco Industries, Inc., Toledo, Ohio

Filed Aug. 6, 1980, Ser. No. 175,837

Int. Cl.³ G01N *27/42*

U.S. Cl. 324—426 **16 Claims**



1. Battery testing apparatus comprising frame means, a plurality of driven rollers mounted in horizontal, parallel relationship on said frame means, means for driving said rollers to move batteries along said frame means, first stop means for stopping batteries at a predetermined position along said frame means, means for holding the batteries at the predetermined position, a first pair of terminal pads, means for moving said first pair in vertical, parallel paths toward and away from the batteries, a second pair of terminal pads, second means for

moving said second pair of terminal pads in horizontal, parallel paths toward and away from the batteries, means downstream of the predetermined position for ejecting batteries off said rollers and said frame means, an entry conveyor for moving batteries toward said frame means and onto said rollers, second stop means for stopping batteries substantially on said entry conveyor, and means engagable by the batteries for operating said first and said second stop means.

4,377,787

SYSTEM FOR MEASURING STATE OF CHARGE OF STORAGE BATTERY

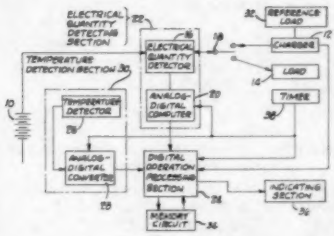
Takao Kikuoka, Honjoh; Hiroaki Yamamoto, Fukaya; Noriyoshi Sasaki, Honjoh; Kotaro Wakui, Mitaka; Keinosuke Murakami, Machida; Kazunori Ohnishi; Gou Kawamura, both of Tokyo; Hiroshi Noguchi, Higashikurume, and Fumio Ukigaya, Higashiyamato, all of Japan, assignors to Shin-Kobe Electric Machinery Co., Ltd.; Nippon Hōsō Kyōkai (The Japan Broadcasting Corporation); Hitachi, Ltd. and Hitachi Denshi Kabushiki Kaisha, all of Tokyo, Japan

Filed Aug. 8, 1980, Ser. No. 176,356

Claims priority, application Japan, Aug. 14, 1979, 54-103382

Int. Cl.³ G01N *27/42*

U.S. Cl. 324—431 **28 Claims**



1. A system for measuring the state of charge of a storage battery comprising:

an electrical quantity detecting section for detecting the quantity of electricity charged to said storage battery and the quantity of electricity discharged therefrom, and outputting said detected electrical quantities as digital signals;

a temperature detecting section for detecting a temperature of said storage battery and outputting said detected temperature as a digital signal;

a memory means including a first memory having at least data on the discharge capacity of said storage battery at said detected temperature with respect to the discharge capacity of said storage battery at a standard temperature stored therein, a second memory having data on the charging efficiency of said storage battery in relation to a charging rate of said storage battery and said detected temperature stored therein, and a third memory having operational equations stored therein which are necessary for calculating at least one of an effective electrical quantity which said storage battery can discharge and an effective time which said storage battery can discharge an effective quantity of electricity based on said detected electrical quantities and detected temperature of said storage battery;

a digital-operation processing section for calculating at least one of said effective electrical quantity and said effective time by digital-operation based on said output signals of said electrical quantity detecting section and said temperature detecting section, and said data and operational equations stored in said memory means; and

an indicating section for indicating at least one of said effective electrical quantity and said effective time so calculated.

4,377,788

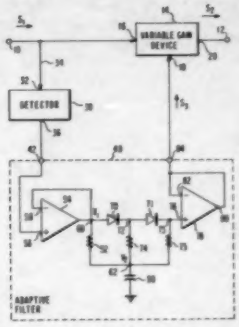
SIGNAL EXPANDER

Todd J. Christopher, Indianapolis, and Gopi N. Mehrotra, Carmel, both of Ind., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 29, 1981, Ser. No. 229,743

Int. Cl.³ H03G *3/30*

U.S. Cl. 330—136 **6 Claims**



1. A signal expander, comprising, in combination:

input means for receiving an input signal to be expanded;

detector means responsive to said input signal for producing a first control signal having an amplitude which varies as a function of the envelope of said input signal;

variable gain means having a first input terminal coupled to receive said input signal, a second input terminal for receiving an expansion control signal and an output terminal for providing an expanded output signal; and

adaptive filter means responsive to said first control signal for producing said expansion control signal and supplying said expansion control signal to said second input terminal of said variable gain means, said adaptive filter means comprising:

low pass filter means including a capacitor and a current source means, said curent source means being responsive to said first control signal produced by said detector means for supplying charging current to said capacitor proportional to a potential difference, V_1-V_2, wherein V_1 is a voltage proportional to said first control signal and V_2 is a voltage stored in said capacitor as a result of the charging thereof and independent of the instantaneous value of said charging current; and

analog gating means for coupling the greater of said second voltage, V_2, or a third voltage, V_3, to said second input terminal of said gain control means, the voltage V_3 being equal to a potential difference $V_1-K_1-K_2$ wherein K_1 and K_2 are each non-zero constants, said analog gating means including a first current path for augmenting the current supplied to said capacitor when the voltage V_1 exceeds V_2+K_1, said analog gating means also including a second current path for augmenting the current supplied to said capacitor when the voltage V_1 exceeds $V_2+K_1+K_2$.

4,377,789

OPERATIONAL AMPLIFIER EMPLOYING COMPLEMENTARY FIELD-EFFECT TRANSISTORS

Merle V. Hoover, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 20, 1981, Ser. No. 246,027

Int. Cl.³ H03G *3/00*; H03F *3/45*

U.S. Cl. 330—253 **14 Claims**

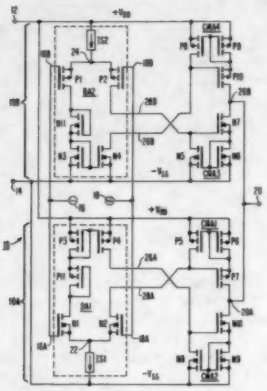
1. An operational amplifier circuit comprising:

first and second input terminals and an output terminal;

first and second supply terminals for receiving operating potential;

first and second differential amplifying means of first and second complementary conductivity types, respectively, each having first and second input connections to which said first and second input terminals respectively connect, and each having first and second output connections;

first and second current mirror amplifying means of said second and first conductivity types, respectively, each having an output connection to which said output terminal connects, each having a respective common connection to which said first and second supply terminals re-



spectively connect, and each having a respective input connection to which the second and first output connections of said first differential amplifying means respectively connect; and

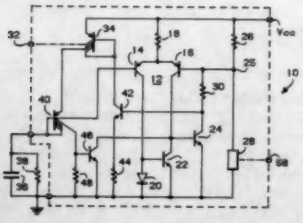
third and fourth current mirror amplifying means of said first and second conductivity types, respectively, each having an output connection to which said output terminal connects, each having a respective common connection to which said second and first supply terminals respectively connect, and each having a respective input connection to which the second and first output connections of said second differential amplifying means respectively connect.

4,377,790

PRECISION DIFFERENTIAL RELAXATION OSCILLATOR CIRCUIT

Don W. Zobel, and W. David Pace, both of Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 31, 1981, Ser. No. 298,126
Int. Cl.³ H03K *4/50*
U.S. Cl. 331—111 **14 Claims**



1. An oscillator, comprising:

frequency determining means including charge storage means;

comparator means having first and second inputs and an output, said first input receiving a threshold determining voltage, said second input being coupled to said frequency determining means, said comparator means switching between first and second operating states as the voltage across said charge storage means exceeds a first threshold voltage for providing a control signal at said output;

switchable threshold voltage circuit means operatively coupled between said output and first input of said comparator means which when enabled is responsive to said control signal for switching said threshold determining voltage from said first threshold voltage to a second threshold voltage;

charge circuit means operatively coupled to said switchable threshold voltage circuit means for supplying a charging current to said charge storage means when enabled by said switchable threshold voltage circuit means being disabled;

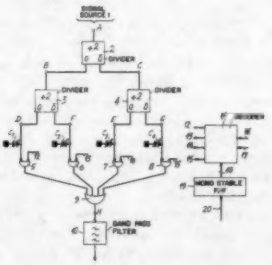
current detecting means operatively connected between said charge circuit means and said output of said comparator means, said current detecting means detecting a current proportional to said charging current for disabling said switchable threshold voltage circuit means whenever said charging current is greater than a predetermined value, said current detecting means being disabled whenever said charging current becomes less than said predetermined value for enabling said switchable threshold voltage circuit means so that said charge circuit means is disabled to allow said charge storage means to discharge to said second threshold voltage level.

4,377,791

PHASE DISPLACEMENT MODULATOR HAVING FOUR QUADRANT PHASES

Roland Bailly, 62, rue de l'Egalite 114 La Fleche, F-92131 Issy-less-Moulineaux, and Daniel Duponteil, 45-rue Anatole France, F-92370 Chaville, both of France

Filed Oct. 24, 1980, Ser. No. 200,470
Claims priority, application France, Oct. 31, 1979, 79 27518
Int. Cl.³ H04L *27/20*
U.S. Cl. 332—9 R **2 Claims**



1. A phase displacement modulator using four phases, said modulator comprising carrier signal source means having a predetermined carrier frequency, numerical signal generator means having four outputs which respectively deliver four signals each having the carrier frequency, means coupled to the four outputs of said generator means for adjusting a dephasing between the signals appearing thereat, the respective phases of said four outputs being 0, $\pi/2$, π, and $3\pi/2$, encoder means having four inputs which are respectively connected to the four outputs of said numerical signal generator means, said encoder means having two governing inputs, means for respectively applying a modulating signal to the two governing inputs, said modulating signals being two successions of im-

pulses, band pass filter means, said encoder means having four outputs which are connected to the input of said band pass filter means having an output which delivers a four state phase displacement modulated signal, and monostable multivibrator means driven responsive to a clock pulse stream having the same frequency as the binary modulating signal, said encoder means having a validation input which is connected to the output of said monostable multivibrator, the monostable multivibrator means having its output activated only during a fraction of the clock signal period.

4,377,792

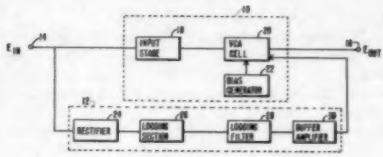
COMPANDER SYSTEM

David E. Blackmer, Wilton, N.H., and David R. Welland, Boston, Mass., assignors to DBX, Inc., Newton, Mass.

Continuation of Ser. No. 247,830, Mar. 26, 1981, abandoned. This application Jan. 14, 1982, Ser. No. 387,822

Int. Cl.³ H04B *1/64*

U.S. Cl. 333—14 **27 Claims**



1. A signal conditioning system comprising, in combination:

(A) a gain control module for varying a gain impressed upon an input signal as a function of a control signal, said module comprising:

(1) a first operational amplifier stage having an input terminal coupled to receive said input signal and an output terminal;

(2) first log conversion means disposed in each of two feedback paths coupling said input terminal of said amplifier stage with said output terminal for providing a log signal as a function of the logarithm of a corresponding one of two representation of said input signal;

(3) antilog conversion means coupled to each log conversion means for providing an antilog signal as a function of the antilogarithm of the sum of the corresponding log signal and said control signal; and

(4) first bias generating means for generating a bias current through said log conversion means of both said feedback paths and through said antilog conversion means; and

(B) control signal generating means for detecting said input signal and for generating said control signal responsively thereto, said control signal generating means comprising

(1) operational rectifier means for providing a rectified signal which is a substantial rectification of said input signal, said rectifier means having an input terminal adapted to receive said input signal and an output terminal for providing said rectified signal, said rectifier means comprising

(a) a second operational amplifier stage having an input terminal coupled to the input terminal of said rectifier means and an output terminal;

(b) first current conduction means responsive to the output of said second operational amplifier stage and defining a transmission path between the input and output terminals of said rectifier means for substantially conducting one representation of said input signal between the input and output terminals of said rectifier means;

(c) second current conduction means responsive to the output of said second operational amplifier stage and defining a second transmission path between the input and output terminals of said second operational amplifier stage for substantially conducting the other representation of said input signal between the input and output terminals of said second operational amplifier stage;

(d) signal generating means responsive to said input signal when substantially conducted through said second transmission path for generating an inverted signal of said other representation of said input signal;

(2) second log conversion means coupled to the output of said operational rectifier means for providing a second log signal as a function of the logarithm of said rectified signal; and

(3) means including a low pass filter coupled to the output of said second log conversion means for providing said control signal substantially as a function of the DC value of said second log signal.

4,377,793

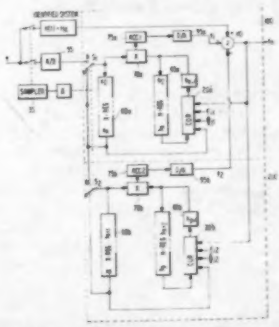
DIGITAL ADAPTIVE FINITE IMPULSE RESPONSE FILTER WITH LARGE NUMBER OF COEFFICIENTS

Otakar A. Horna, Bethesda, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Jan. 13, 1981, Ser. No. 224,853

Int. Cl.³ H03H *17/04, 21/00, 15/02*

U.S. Cl. 333—165 **14 Claims**



1. An adaptive multi-loop filter system for receiving (i) a signal input to a system to be characterized and (ii) a signal output from said system to be characterized for producing an estimated replica signal of said signal output, said filter system comprising:

at least first and second filter units connected in cascade, each of said filter units comprising (i) receiving means receiving signal samples related to said signal input, each said receiving means includes first storage means having an input and an output, the output of said first storage means in said first filter unit being applied to the input of said first storage means in said second filter unit, (ii) characterizing means for characterizing the estimated partial impulse response of said system, the output of said first storage means also being applied to an input of said characterizing means, and (iii) means responsive to said receiving means and said characterizing means for producing an estimated partial replica signal,

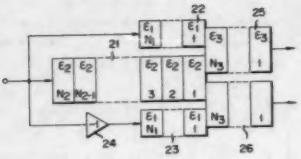
means for combining said estimated partial replica signals from said first and second filter units to form said estimated replica signal of said signal output,

means for producing an error signal representative of the difference between the signal output of the system to be characterized and said estimated replica signal, and means for updating the value of said partial estimated impulse response signals as a function of said error signal and said signal samples related to said signal inputs.

4,377,794
CHARGE TRANSFER DEVICE COMB FILTER WITH IMPROVED FREQUENCY RESPONSE

Tatsuo Sakaue, Yokohama, and Chikara Sato, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 5, 1981, Ser. No. 240,922
Claims priority, application Japan, Mar. 18, 1980, 55-33350
Int. Cl.³ H04N *9/535*; H03H *11/06, 17/06*; G11C *19/28*
U.S. Cl. 333—165 **2 Claims**

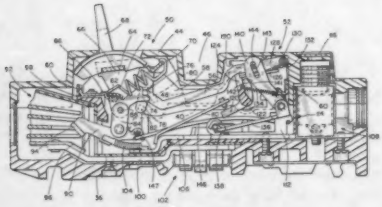


1. A CCD comb filter including long and short CCD delay lines connected to receive a common input signal and arranged to combine output charge packets of said long and short CCD delay lines characterized in that the product of the number of stages of said long CCD delay line and transfer inefficiency of each stage thereof is substantially equal to that of the number of stages of said short CCD delay line and transfer inefficiency of each stage thereof.

4,377,795
CIRCUIT BREAKER WITH SNAP ACTION MAGNETIC TRIP ACTUATOR

John T. Schultz, and Clifford F. Bishop, both of Cedar Rapids, Iowa, assignors to Square D Company, Palatine, Ill.

Continuation of Ser. No. 90,946, Nov. 5, 1979, Pat. No. 4,307,359. This application Jul. 29, 1981, Ser. No. 287,853
Int. Cl.³ H01H *73/48*
U.S. Cl. 335—23 **3 Claims**

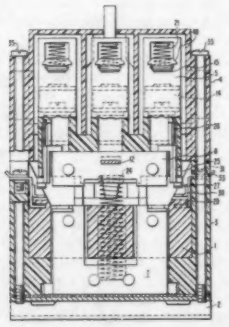


1. A circuit breaker comprising:
an insulating housing,
a handle arm pivotally supported in said housing,
a contact blade having a blade contact,
a stationary contact positioned for engagement by said blade contact,
a pair of pivotally interconnected toggle links with one of said links having a first translatable pivot and the other link having a blade pivot connection with said blade, said translatable pivot having a set position and a trip position,
a toggle spring interconnecting said handle arm and said one link,
securing means for securing said first translatable pivot against translation in response to pivoting movement of said handle arm in one direction from a selected position to tense said toggle spring and move said translatable pivot to said set position and for thereafter enabling the pivoting movement of said handle arm in a direction opposite said one direction to align the pivot interconnection of said links with said blade pivot connection said said translatable pivot along a common line while retaining said translatable pivot in said set position to resist the tension of said toggle spring and engage said contacts with each other,
and current controlled means responsive to a current greater than a predetermined value passing through said contacts for controlling said securing means to enable said toggle spring means to translate said translatable pivot from said common line set position to said trip position and for disengaging said contacts and for moving said handle arm in said one direction to said selected position;
said current controlled means including a biased armature moved against said bias in response to the passage of said current greater than said predetermined value, and link means connected to said armature and to said translatable pivot for providing a positive driving force to release said securing means and to effect disengagement of said contacts in response to the movement of said armature against said bias.

4,377,796
ELECTRIC CONTROL DEVICE

Kurt A. Grunert, Beaver; Charles R. Paton, Daugherty Township, Beaver County; John J. Henwood, Beaver; John J. Dauer, Jr., Brighton Township, Beaver County, and Birch L. DeVault, Beaver, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 126,095, Feb. 29, 1980, abandoned. This application May 1, 1981, Ser. No. 259,647
Int. Cl.³ H01H *51/08*
U.S. Cl. 335—131 **3 Claims**



1. An electric control device, comprising a base; an insulated housing mounted on the base; a control mechanism supported on the housing; the control mechanism comprising a first stationary contact and movable contact combination and operating means; the first stationary contact and movable contact combination being disposed to open and close an electric circuit; the operating means disposed to operate the first contact combination between the opened and closed operating positions; said operating means comprising a coil and armature combination; said operating means further comprising an insulating contact carrying structure mounted generally upon said armature; said first stationary contact of the stationary contact and movable contact combination is generally mounted upon said insulating housing; said first movable contact of the stationary contact and movable combination is generally mounted upon said insulating contact carrying structure whereby upon energization of the coil the armature is disposed to move the insulating contact carrying structure to carry the first movable contact into engagement with the first stationary contact to open and close the electric circuit; and
a second contact combination, comprising a second stationary contact structure mounted generally integral with the

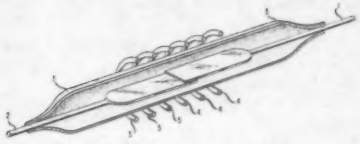
coil; a second movable contact structure mounted generally integral with the insulating contact carrying structure whereby upon energization of the coil the contact carrying structure is disposed to carry the second movable contact into engagement with the second stationary contact to open and close an electric circuit.

4,377,797

MAGNETICALLY ACTUATED DEVICE COMPRISING AN FE-MO-NI MAGNETIC ELEMENT

Sungho Jin, Gillette, and Thomas H. Tiefel, Rockaway, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 178,832, Aug. 18, 1980, Pat. No. 4,340,434.
This application Apr. 1, 1982, Ser. No. 364,622
Int. Cl.³ H01H *1/66*
U.S. Cl. 335—153 **9 Claims**



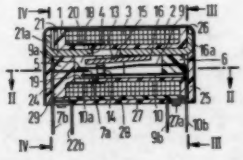
1. Device comprising a component whose position is dependent on strength or direction or presence of a magnetic field, said component comprising a body of a metallic alloy having a magnetic squareness ratio which is greater than or equal to 0.9 and said body having remanent magnetic induction which is greater than or equal to 13000 gauss, said device comprising means for exposing said body to at least a first magnetic field which results in said component being in a first position, said device comprising means for sensing the position of said component, said device being characterized in that an amount of at least 99.5 weight percent of said alloy consists of Fe, Mo, and Ni, Mo being in the range of 2–26 weight percent of said amount, and Ni being in the range of 0.5–15 weight percent of said amount.

4,377,798

ELECTROMAGNETIC RELAY

Helmut Schedele, Diessen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 11, 1981, Ser. No. 272,665
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1980, 3025814
Int. Cl.³ H01H *51/28*
U.S. Cl. 335—202 **7 Claims**



1. An electromagnetic relay comprising:

a one-piece coil body having a hollow interior forming a contact chamber inside said relay and about which an electromagnetic coil is wound,

said coil body having one open end communicating with said contact chamber and an opposite end closed by a vertical wall integrally formed with said coil body;

a plurality of movable spring contact elements disposed in said contact chamber substantially axially parallel to one another;

a plurality of stationary counter contact elements disposed in said contact chamber for making and breaking with said movable spring contact elements, said movable spring contact elements and said counter contact elements projecting into said contact chamber from opposite ends thereof and overlapping at their respective contact-making ends;

a contact mount inserted and fitted in said open end of said coil body for carrying said movable contact elements,

said stationary counter contact elements being embedded in said vertical wall;

a yoke plate and an armature for actuating said movable spring contact elements, said yoke plate and said armature also mounted on said contact mount; and

said coil body having at least one radial opening communicating with said contact chamber in a region of said contact-making ends of said movable and stationary contact elements,

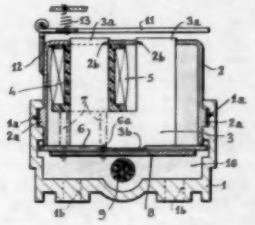
said opening permitting adjustment and alignment of said contact elements in said contact chamber after assembly thereof and said opening being subsequently covered by said electromagnetic coil winding.

4,377,799

CONTROL UNIT COMPRISING ELECTROMAGNETS, PARTICULARLY FOR ACTUATING DOBBIES FOR WEAVING MACHINES

Jean-Paul Froment, Doussard, France, assignor to S.A. des Etablissements Staubli, Faverges, France

Filed Apr. 24, 1981, Ser. No. 257,034
Claims priority, application France, May 6, 1980, 80 10548
Int. Cl.³ H01F *7/08*
U.S. Cl. 335—266 **3 Claims**



1. An electromagnetic control unit for actuating mobile armature members to control a dobby for a weaving machine, the control unit comprising:

an elongated frame of U-shaped cross section;

a hollow cover for the frame, the cover having a face having two parallel series of paired core-receiving holes therethrough, and having an open base shaped to be received in the U-shaped frame and enclose it;

multiple cores, each having two arms extending outwardly through adjacent holes of the two series and having between the two arms a centering boss;

a positioning plate lying across the open base of the cover and having a series of windows each receiving the centering boss of a core;

a coil surrounding one arm of each core and having connections to its winding, the coils lying between the cover face and the positioning plate;

a printed circuit board adjacent to the positioning plate and connected to the connections of the coils;

a cable coupled to the connections of the circuit board and extending from the frame; and

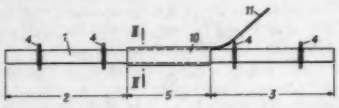
a synthetic resin filling the free space in the frame and the cover.

4,377,800

DATUM SENSOR FOR MEASURING ELONGATIONS

Stephan Fuld, Berghofergasse 35/10, A-1120 Vienna, and Hans Peterschinegg, Schindlergasse 31, A-1180 Vienna, both of Austria

Filed Jan. 21, 1981, Ser. No. 226,982
Claims priority, application Austria, Feb. 27, 1980, 1092/80
Int. Cl.³ H01L 1/22
U.S. Cl. 338—2 10 Claims



1. A datum sensor for measuring elongations in concrete buildings, adapted for location within a concrete section to be measured and comprising:

a hollow metal carrier member having first and second end portions, adapted for adhering the sensor to concrete, and a middle portion comprising a measuring section and adapted for being located in the concrete section to be measured;

a plurality of strain gauges fastened along the outer periphery of said middle portion of said hollow metal carrier member; and

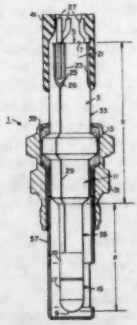
the hollow carrier member is constructed such that when said sensor is located within a concrete section to be measured the ratio of the cross-sectional area (F_B) of said measuring section defined by the outer surface of said carrier member to the cross-sectional area (F_M) of the hollow section of the carrier member is equal to the ratio of the coefficient of elasticity (E_M) of the metal of said carrier member to the coefficient of elasticity (E_B) of the concrete to be measured.

4,377,801

OXYGEN SENSOR FOR DETECTING THE OXYGEN CONTENT OF AN INTERNAL COMBUSTION ENGINE EXHAUST GAS SYSTEM

David C. Weber, Toledo; Alan H. Bilger, and Philip R. Woodruff, both of Tiffen, all of Ohio, assignors to Bendix Autolite Corporation, Fostoria, Ohio

Filed Oct. 15, 1981, Ser. No. 311,685
Int. Cl.³ H01L 7/00
U.S. Cl. 338—34 10 Claims



1. An oxygen sensor for detecting the oxygen content of the gaseous atmosphere in an internal combustion engine exhaust gas system, having a first resistive element having an electrical resistance characteristic that varies as a function of both temperature and the presence of oxygen in said gaseous atmosphere to which the element is exposed, and a second resistive element having an electrical resistance characteristic that varies as a function of the temperature of said gaseous atmosphere to which the element is exposed in a manner similar to that of the first resistive element, and either varies negatively or does not vary as a function of the oxygen in said gaseous atmosphere, comprising:

a generally cylindrical hollow electrical insulator having an open end, a closed end, and an intermediate portion;

said first and second resistive elements being situated on the outer surface of the insulator adjacent the closed end;

a plurality of grooves in the outer surface of the insulator adjacent to and communicating with the open end;

a shoulder formed about the insulator at the intermediate portion thereof;

electrically conductive film means extending from said first and second resistive elements and over the surface of the intermediate portion to said grooves;

a threaded metal shell enclosing the intermediate portion of the insulator; and

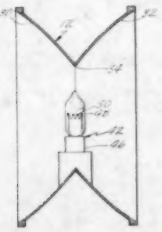
a dielectric coating over said film means in the area of the metal shell to insulate the film means from the shell.

4,377,802

LAMP/REFLECTOR ASSEMBLY

Robert A. Ferenc, Middletown, Conn., assignor to Whelen Engineering Company, Inc., Deep River, Conn.

Filed Mar. 12, 1981, Ser. No. 242,937
Int. Cl.³ B60Q 1/26
U.S. Cl. 340—84 8 Claims



1. A warning light assembly comprising:

reflector means, said reflector means having two coaxial concave surfaces, said concave surfaces being reflective and arranged back-to-back, said surfaces intersecting at a common plane perpendicular to the axis thereof, an aperture coaxial with said surfaces being defined by the intersection of said surfaces;

light source means, said light source means being supported in reflector means, said light source means including an incandescent lamp positioned with its filament at least in part lying in said plane of intersection; and

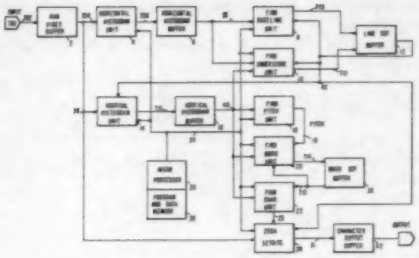
means for rotating said reflector means and said light source means as a unit.

4,377,803

ALGORITHM FOR THE SEGMENTATION OF PRINTED FIXED PITCH DOCUMENTS

Jeffrey B. Lotspiech, Boulder, and Wayne L. Wohler, Longmont, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 2, 1980, Ser. No. 165,879
Int. Cl.³ G06K *9/34*
U.S. Cl. 382—9 **18 Claims**



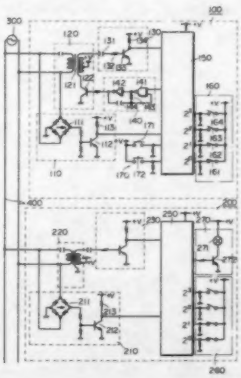
1. A method for segmenting data in an OCR device, said method comprising the following steps:
- generating a video stream of data representative of the information contents of a line of data to be segmented;
- generating a horizontal histogram for the video stream of data;
- determining a baseline for the video stream of data;
- generating a vertical histogram for the video data;
- first generating the coordinates for each word in the video stream of data; and
- second generating the coordinate for each character associated with a word.

4,377,804

SYNCHRONOUS DATA TRANSMISSION SYSTEM UTILIZING AC POWER LINE

Yoshiharu Suzuki, Kadoma, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Oct. 24, 1980, Ser. No. 200,079
Claims priority, application Japan, Oct. 31, 1979, 54-141577; Nov. 21, 1979, 54-151210
Int. Cl.³ H04M *11/04*; H04Q *9/00*
U.S. Cl. 340—310 A **20 Claims**



1. A data transmission system utilizing a power line coupled to an alternating current power supply for transmission of data having a plurality of bits, said data being transmitted in synchronism with the cycles of said alternating current power supply, said data transmission system comprising:
- a plurality of transmitters coupled to said power line; and
- a plurality of receivers coupled to said power line; each said transmitter including:
  - synchronizing signal generating means responsive to the cycles of said alternating current for generating a synchronizing signal in synchronism with the cycles of said alternating current,
  - data generating means for generating data for transmittal, said data including receiver identifying information for identifying one of said receivers to receive said data being transmitted and control information for representing a control to be made in said one receiver,
  - busy state information generating means for generating information representing that said data is being transmitted by said data generating means,
  - each cycle of said alternating current comprising a first phase section for transmission of said busy state information and a second phase section for transmission of said data,
  - transmitting means responsive to said synchronzing signal generating means of said transmitter, said data generating means and said busy state information generating means for transmitting a high frequency carrier wave signal representing said busy information in said first phase section of each cycle of said alternating current and for transmitting a high frequency carrier wave signal representing said data in said second phase section of each cycle of said alternating current,
  - receiving means for receiving said high frequency carrier wave signal transmitted by other ones of said transmitters, and
  - transmission inhibiting means operatively coupled to said receiving means of said transmitter and said transmitting means of said transmitter for inhibiting transmission of said high frequency carrier wave signal in response to said busy state information of other transmitters;
  - each said receiver including:
  - synchronizing signal generating means responsive to the cycles of said alternating current for generating a synchronizing signal in synchronism with the cycles of said alternating current,
  - receiving means responsive to said synchronizing signal generating means for receiving said high frequency carrier wave signals in said first and second phase sections of each cycle of said alternating current, and
  - decoding means responsive to said receiving means of said receiver for decoding said receiver identifying information and said control information being transmitted and for providing a control signal associated with said control information provided to said one receiver identified by said receiver identifying information.

4,377,805

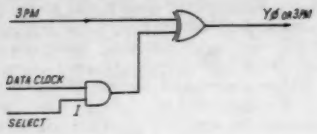
MAGNETIC RECORDING

Paul Youhill, Weston Super Mare, England, assignor to EMI Limited, Hayes, England

Filed Apr. 20, 1981, Ser. No. 255,507
Int. Cl.³ H03K *13/24*
U.S. Cl. 340—347 DD **4 Claims**

1. An apparatus for encoding binary data signals comprising means for encoding said data signals, at a prearranged clocking frequency, according to the 3PM format, and an exclusive OR gate for receiving said encoded signals at one input terminal,

and for receiving clocking pulses, at said prearranged frequency, at the other input terminal, and means for receiving at



an output location encoded data signals generated at the output terminal of said OR gate.

4,377,806

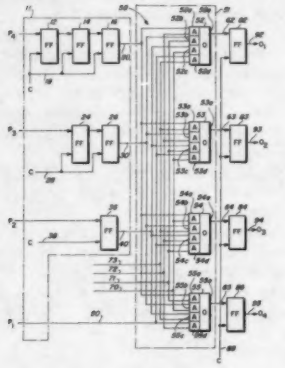
PARALLEL TO SERIAL CONVERTER

Joseph E. Elliott, Green Valley, and John R. Elliott, Tucson, both of Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 13, 1981, Ser. No. 263,379

Int. Cl.³ H03K *13/258*

U.S. Cl. 340—347 DD **2 Claims**



1. In a parallel to serial conversion system,

variable delay means adapted to receive a plurality of input signals on parallel input lines with a different number of shift register cells being provided for each input line, each of said cells imparting a fixed delay to the transmission characteristic of said line, to delay the input signals on each of said lines by a different predetermined interval,

output register means having a plurality of output register cells and output signal terminals corresponding in number to the input lines, with all of the cells being clocked from a single timing input terminal, and selector, array means comprising a plurality of AND gates and a single OR gate associated with each output register cell, and circuit means interconnected between the delay means and the AND gates whereby each of the delayed input signals is allocated to a different one of said output register lines.

4,377,807

COARSE/FINE DIGITAL PATTERN COMBINER FOR HIGH ACCURACY

Elzie H. Freeman, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 10, 1981, Ser. No. 300,867

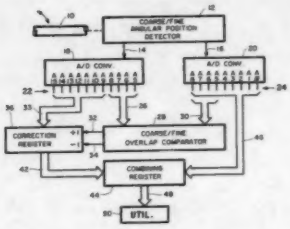
Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 P **6 Claims**

3. A rotary shaft position measuring system of the type including rotation detecting means for generating a plural bit coarse count binary word and a plural bit fine count binary word, coarse/fine count comparator means, responsive to a predetermined number of overlapping bits of the coarse and fine count words, for providing command signals for correcting the non-overlapping portion of the coarse count word prior to combining with the fine count word to provide a combined binary word representing shaft position, said system being characterized by the improvement wherein said comparator means comprises:

a plurality of first inverter means, corresponding in number to said predetermined number, for inverting said overlapping bits of said coarse count binary word;

a plural bit binary full adder means for subtracting said



overlapping bits of said coarse count binary word from said overlapping bits of said fine count binary word to provide a ΣN output, where N is said predetermined number, and a carry out output;

first AND gate means, responsive to said ΣN and said carry out outputs, for providing as one of said command signals a first true output only when both of said ΣN and said carry out outputs are true;

second inverter means for inverting said ΣN and said carry out outputs; and

second AND gate means, responsive to outputs of said second inverter means, for providing as another of said command signals a true output only when both of said ΣN and carry out outputs are not true.

4,377,808

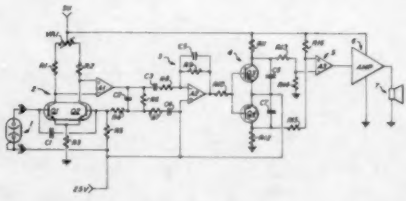
INFRARED INTRUSION ALARM SYSTEM

Lin Kao, Hong Kong, Hong Kong, assignor to Sound Engineering (Far East) Limited, Kowloon, Hong Kong

Filed Jul. 28, 1980, Ser. No. 172,802

Int. Cl.³ G08B *23/00, 17/12*

U.S. Cl. 340—527 **10 Claims**



1. An intrusion alarm system comprising:

at least first and second sensors responsive to radiation emanating from spatially distinct locations;

means for subtractively combining the output signals of said sensors to produce an output signal having a first or second signal level respectively on opposite sides of a quiescent operating level, depending on the radiation impinging on said sensors; and,

motion discriminating means for receiving said output signal

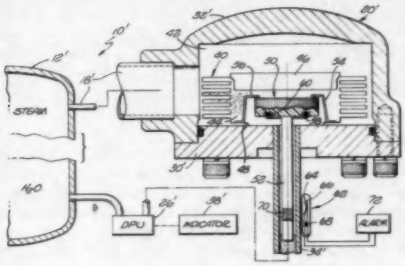
from said combining means and determining the time delay between the occurrence of an output signal of one signal level and the subsequent occurrence of an output signal of the opposite signal level, said motion discriminating means activating an alarm device only when said determined time delay is within a predetermined limit indicating movement of a radiation emanating object between spatially distinct locations.

4,377,809

LIQUID LEVEL SYSTEM

Victor N. Lawford, Pasadena, Calif., assignor to ITT, New York, N.Y.

Filed Apr. 27, 1981, Ser. No. 257,741
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—623 **1 Claim**



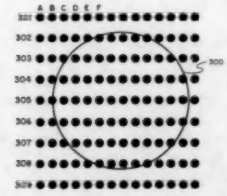
1. A fluid link for a liquid level system comprising: a housing; movable pressure sensitive barrier means dividing said housing into separate first and second chambers; said housing having an inlet for admitting fluid under pressure into said first chamber; differential pressure sensing means; a conduit providing flow communication between said second chamber and said differential pressure sensing means; an incompressible liquid filling said second chamber and said conduit; a float in said second chamber, said float carrying switch actuating means; switch means adapted to be connected to indicating means, said switch means being actuated in response to the position of said switch actuating means on said float; and sealing means on said float for closing off said conduit when said liquid is lost therefrom.

4,377,810

LIGHT PEN DETECTION CIRCUIT AND METHOD

Kenneth T. Wolff, Medway, Mass., assignor to Data General Corporation, Westboro, Mass.

Filed Dec. 4, 1980, Ser. No. 213,244
Int. Cl.³ G09G *1/16*
U.S. Cl. 340—707 **15 Claims**



1. In a raster scan CRT and light pen apparatus, said apparatus having a source of clock cycle pulses, a circuit for detection of the location of the sensing aperture of a light pen on the face of the CRT, said CRT face being scanned by simultaneously moving the electron beam of said CRT in two directions, a first direction and a second direction, said second direction being substantially perpendicular to said first direction, the movement in said first direction being substantially more rapid than the movement in said second direction, said circuit comprising:

means for determining if an illuminated CRT location has been detected by said light pen during a scan;

means for retaining position information descriptive of the location in said second direction at which said illuminated location was detected;

means responsive to clock cycle pulses for counting said clock cycle pulses;

means for setting and starting said clock cycle counter means when said illuminated location is detected;

first means for resetting and again starting said counter means, said first means to perform resetting and starting of said counter means when the beam of the CRT has reached the same position in said first direction at which said counter means was started on the previous raster line;

second means for resetting and again starting said counter means, said second means to perform resetting and starting of said counter means when an illuminated location on a raster line is detected by said light pen before said beam of the CRT has reached the same position in said first direction at which said counter means was started on the previous raster line;

means for replacing the information in said second direction position retaining means when said counter means is started by said second means;

means for insuring that said counter means can be started only once per raster line scan; and

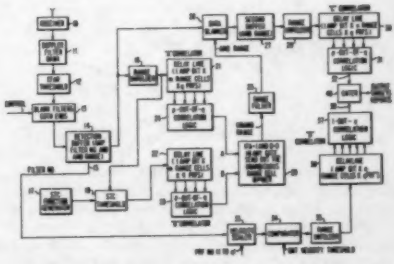
means for resetting said circuit.

4,377,811

MEDIUM PRF PULSE DOPPLER RADAR HAVING SIMPLIFIED GROUND MOVING TARGET REJECTION CAPABILITIES

David H. Mooney, Jr., Arnold, and Keith A. Harriger, Ellicott City, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 7, 1981, Ser. No. 223,177
Int. Cl.³ G01S *13/04*
U.S. Cl. 343—7 A **9 Claims**



1. In a single channel radar receiver responsive to return signals that include discrete sidelobe clutter returns and returns representative of targets having velocities both greater than and less than a predetermined first threshold velocity, and having means for correlating the returns to provide a first correlation signal and means for thresholding the returns over a predetermined period of time and correlating such thresholded return to provide a second correlation signal and having means including the first and second correlation signals to detect and blank the discrete sidelobe returns, and having means to correlate the blanked returns over a predetermined number of range cells to provide a third correlation signal indicative of the unambiguous range of any target return signals, the improvement of:

a doppler notch filter operatively connected to blank return signals corresponding to target velocities below a predetermined second threshold velocity that is less than the first threshold velocity,

means governed by the outputs of the notch filter to indicate a fast fourier transform filter number for each range gate interpulse period to generate a true velocity signal independent of pulse repetition frequency,

means to compare the filter number during each radar look with a data value corresponding to the first threshold velocity, and

means responsive to said comparison means and the third correlation signal to provide an output signal for each range gate indicative of the unambiguous range of only those target return signals above the first threshold velocity value.

4,377,812

SEGMENTED PROTECTIVE SHELL FOR TOWER MOUNTED ANTENNAS WITH VIBRATION DAMPING

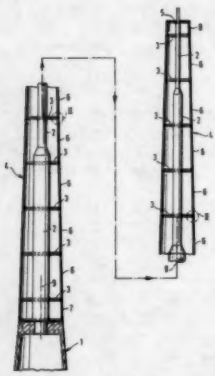
Arthur Göbel; Rudolf Göbel, and Hartmut Patschke, all of Ludwigshafen, Fed. Rep. of Germany, assignors to G + H Montage GmbH, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 22, 1980, Ser. No. 218,831

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951590; Jun. 28, 1980, 3024505

Int. Cl.³ H01Q *1/42*

U.S. Cl. 343—872 **17 Claims**



1. A tower or cupola-like covering for the protection of antennae for electro-magnetic radiation against the weather, the antennae being fastened to supporting structure within the covering and the latter being in the form of a sectioned casing of weather-resistant material permeable to electromagnetic waves, characterized in that each casing section is attached at a location remote from one of its edges rigidly to the supporting structure within the covering and with said one edge being movable relative to the adjacent edge of an adjacent section, and in that the sections have weather-excluding expansion joints therebetween which transmit no supporting forces.

4,377,813

ELECTROCARDIOGRAPH APPARATUS

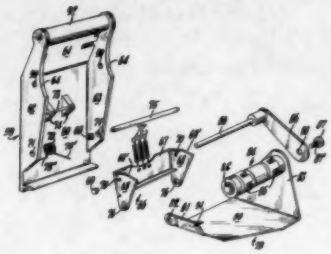
Hyman Grossman, Buchanan, and Claude MacQuignon, Lake Peekskill, both of N.Y., assignors to Cambridge Instruments, Inc., Ossining, N.Y.

Filed Mar. 4, 1981, Ser. No. 240,510

Int. Cl.³ G01D *9/32, 15/28;* A61B *5/04*

U.S. Cl. 346—33 ME **7 Claims**

4. Paper feeding means for electrocardiographic apparatus having a recording pen for movement in a horizontal path comprising a pair of spaced parallel, vertically disposed plates forming a frame, a platen disposed between said plates and hinged at one end to one edge of said plates for movement from a closed, substantially horizontal operating position to a horizontally displaced, open position with an other end of said platen inclined upwardly, a platen roller carried at the other end of said platen, means underlying said platen and carrying means for supporting a supply of recording paper, the last said means being hinged to said one edge of said plates and carrying



a link pivoted at one end to the last said means and at an other end to said platen, a recording paper drive roller carried between said plates in spaced relation to said pen and means for driving said paper drive roller, said platen when in said open position and with said paper being fed from said supply and over the surface of said platen roller being displaceable relative to said frame to bring said platen roller with the recording paper thereon into operable contact with said pen and drive roller.

4,377,814

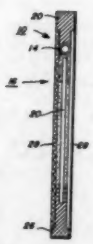
INK JET PRINTING MACHINE

John R. Debesis, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 17, 1981, Ser. No. 255,017

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R **4 Claims**



1. An ink jet printing machine, including:

an array of nozzles;

a plurality of housings for storing a supply of writing fluid for each nozzle of said array of nozzles, each of said plurality of housings having a channel therein in communication with one of the nozzles of said array of nozzles;

a plurality of transducers, each of said transducers being positioned closely adjacent to the channel in one of said plurality of housings so that activation of said transducer ejects droplets of writing fluid from the nozzle in communication with the channel adjacent said transducer; and

two corrugated members interposed between adjacent housings of said plurality of housings for isolating each of said array of nozzles from one another to prevent interaction between said array of nozzles from energizing nozzles other than the selected nozzles of said array of nozzles

wherein the apexes of the intersecting walls of one of said corrugated members engage the apexes of intersecting walls of an adjacent corrugated member.

4,377,815
RECORDING DEVICE

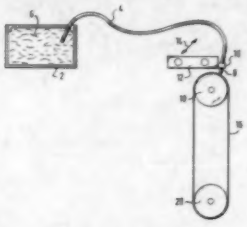
Hans-Georg Henning, Otterfing, and Wolfgang Sebert, Holzkirchen, both of Fed. Rep. of Germany, assignors to Vermes Chemie GmbH & Co. KG., Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 71,297, Aug. 30, 1979, abandoned. This application Aug. 11, 1981, Ser. No. 292,026

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1978, 2839664

Int. Cl.³ G01D 15/16

U.S. Cl. 346—140 R **7 Claims**



1. Recording device, particularly for measuring and registering devices and the like for supplying ink on a registering surface for effecting a record, comprising an ink reservoir, a capillary tube having a first end and a second end with the first end located within said ink reservoir for suctioning ink therefrom by its capillary action and the second end spaced outwardly from said ink reservoir, said capillary tube is formed for the entire length from the first end to the second end of a flexible, wear-resistant plastics material, said plastics material is polyacetal, said second end of said capillary tube comprising a recording tip for supplying ink suctioned by said capillary tube directly from said capillary tube to the registering surface on writing contact of said recording tip with the registering surface, a carriage movable relative to said ink reservoir, said second end of said capillary tube is secured to said carriage for movement therewith so that said second end can traverse the registering surface, and said capillary tube has a uniform interior structure for the length thereof from said first end to said second end.

4,377,816
SEMICONDUCTOR ELEMENT WITH ZONE GUARD RINGS

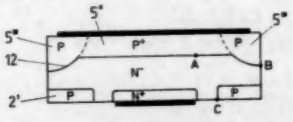
Roland Sittig, Umiken, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Sep. 26, 1979, Ser. No. 79,054

Claims priority, application Switzerland, Oct. 10, 1978, 10478/78

Int. Cl.³ H01L 29/74

U.S. Cl. 357—13 **9 Claims**



1. A semiconductor element of disc shape having upper and lower surfaces and a peripheral surface, comprising:

at least one pn junction with a higher doped conductivity zone on one side and a lower doped zone of the opposite conductivity on the other side, said pn junction extending to the peripheral surface;

said lower doped zone having a surface forming a part of said lower surface and a part of said peripheral surface;

at least one zone guard ring being established in said lower doped zone by a ring shaped region formed inside said lower doped zone, said ring-shaped region having a conductivity type opposite to that of said lower doped zone, and being bounded by parts of said lower and said peripheral surfaces, said surface parts of said lower and said peripheral surfaces bounding said at least one zone guard ring being without electrical contacts; and

the pn junction and the at least one zone guard ring separated by an interval, a, selected small enough such that upon application of a reverse voltage to the pn junction the region of the semiconductor between the pn junction and the guard ring can be depleted of charge carriers at a voltage insufficient to cause junction breakdown.

4,377,817
SEMICONDUCTOR IMAGE SENSORS

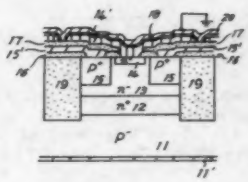
Jun-ichi Nishizawa, and Tadahiro Ohmi, both of Sendai, Japan, assignors to Semiconductor Research Foundation, Japan

Filed Mar. 17, 1980, Ser. No. 130,775

Claims priority, application Japan, Mar. 19, 1979, 54-33024

Int. Cl.³ H01L 29/80

U.S. Cl. 357—22 **10 Claims**



1. A semiconductor image sensor including a multiplicity of photo-sensor elements disposed in a matrix of rows and columns in a semiconductor body having first and second principal surfaces, each photo-sensor element comprising:

a transistor comprising a first current terminal region including a first low resistivity semiconductor region of a first conductivity type disposed in said first principal surface, a second current terminal region including a second low resistivity semiconductor region of said first conductivity type disposed in said semiconductor body below and separated away from said first current terminal region, a current path region including a first high resistivity semiconductor region disposed between said first and second current terminal region, and a control terminal region disposed adjacent to said current path region, said second current terminal region being electrically floated;

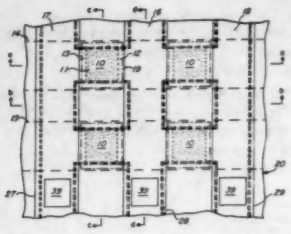
a third low resistivity semiconductor region of said first conductivity type disposed in said second principal surface; and

a photo-sensing semiconductor region disposed between said second and third low resistivity semiconductor regions.

4,377,818
HIGH DENSITY ELECTRICALLY PROGRAMMABLE ROM

Chang-Kiang Kuo, Houston, and Shyh-Chang Tsaur, Stafford, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 957,518, Nov. 2, 1978, Pat. No. 4,258,466. This application Dec. 29, 1980, Ser. No. 220,660
Int. Cl.³ H01L 29/78, 27/02, 27/10, 29/04
U.S. Cl. 357—23 3 Claims



1. A semiconductor device comprising:

a plurality of parallel elongated heavily doped regions of one conductivity type in a face of a body of semiconductor material of opposite conductivity type, such regions covered by field oxide at said face,

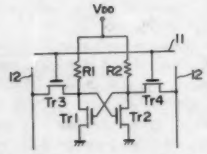
a first layer of polycrystalline silicon overlying said face forming electrodes located between the heavily doped regions and also overlying the heavily doped regions by a significant amount,

a second layer of polycrystalline silicon on said face overlying the first layer and defining a plurality of elongated strips perpendicular to the heavily doped regions and overlying such regions, the second layer having edges coinciding with edges of the first layer.

4,377,819
SEMICONDUCTOR DEVICE

Yoshio Sakai; Toshiaki Masuhara, both of Hachioji; Osamu Minato, Kokubunji; Toshio Sasaki, Hachioji; Hisao Katto, Hinodemachi; Norikazu Hashimoto, Tokorozawa; Shin-ichi Muramatsu, Hachioji, and Akihiro Tomozawa, Hinodemachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 20, 1979, Ser. No. 32,017
Claims priority, application Japan, Apr. 24, 1978, 53-47779
Int. Cl.³ H01L 29/04
U.S. Cl. 357—59 8 Claims



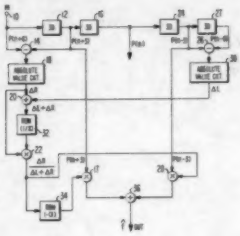
1. A semiconductor device comprising at least a resistance element including a resistance part formed of polycrystalline silicon of a high resistance and p-type conductivity terminal parts formed of polycrystalline silicon of a low resistance at both end portions of said resistance part,

wherein a metal electrode is provided above said resistance part with an insulation layer being interposed therebetween, said electrode being coupled to a predetermined potential, wherein said insulation layer includes a first film containing silicon dioxide as a main component and a second film formed of silicon nitride on said first film through chemical vapor deposition, said first film having a thickness in the range of 5 to 100 nm, and said second film having a thickness in the range of 30 to 100 nm.

4,377,820
ADAPTIVE ERROR CONCEALMENT

Glenn A. Reitmeier, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 30, 1981, Ser. No. 259,361
Int. Cl.³ H04N 9/535, 5/76
U.S. Cl. 358—21 R 8 Claims

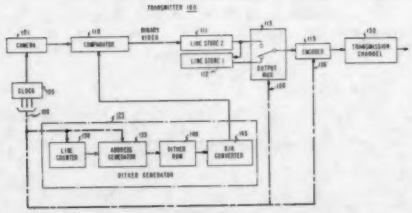


1. A method for estimating a replacement sample for a selected sample of a sampled color television signal, said method comprising computing the amplitude difference between two adjacent samples having the same color subcarrier phase as the selected sample and being to the right side of the selected sample upon display, computing the difference between the amplitude of two adjacent samples having the same color subcarrier phase as the selected sample and being to the left side of the selected sample upon display, computing left and right weighting coefficients respectively comprising the right and left differences divided by the sum of said left and right differences, multiplying said left and right coefficients by said nearest left and right adjacent samples respectively having the same subcarrier phase as the selected sample, thereby resulting in two product signals, and forming an estimated replacement sample for the selected sample by adding said product signals.

4,377,821
ARRANGEMENT FOR PROVIDING A FLICKERLESS ORDERED DITHER IMAGE FOR A VIDEO DISPLAY

Helmuth O. Sautter, Middletown, and Donald B. Swicker, Wall Township, Monmouth County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 24, 1981, Ser. No. 305,165
Int. Cl.³ H04N 7/12
U.S. Cl. 358—133 10 Claims



1. A system for processing a dithered image for display in a plurality of interlaced scanned lines, the system comprising:

means for producing an image signal having multiple picture elements;

means for generating a signal representing a matrix of ordered dither display points from the image signal; and

means for arranging an ordered plurality of rows in the matrix of ordered dither display points, each one of the display points having an intensity determined in response to the signal generating means and being juxtaposed with a display point having the same intensity on an adjacent row in the ordered plurality.

4,377,822
TEST EQUIPMENT FOR A TELETEX TELEVISION RECEIVER

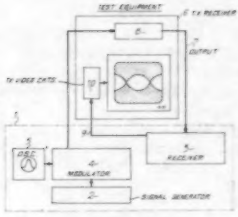
Yves M. Noirel, Montfort; Joseph Blineau; Pierre Leray, both of Rennes, and Jean-Pierre Bauduin, Combourg, all of France, assignors to L'Etat Francais, Represente par le Secre-d-Etat aux Postes et Telecommunications et A la Telediffusion Centre National, both of, France

Filed Nov. 12, 1980, Ser. No. 205,942

Claims priority, application France, Nov. 22, 1979, 79 29335

Int. Cl.³ H04N *7/02, 9/62*

U.S. Cl. 358—139 **9 Claims**



1. Test equipment for the demodulator of a teletext television receiver said test equipment being connected to the video input of the television receiver and comprising a digital test signal generator means for delivering pseudo-random digital data packets with a first frequency of binary elements, HF modulator means responsive to said data packets, an output of said modulator means being coupled to an HF input of the television receiver, and receiver means having a data regeneration circuit means with a controllable variable threshold, the input of said receiver means being connected to a video output of the said demodulator, characterized in that said test signal generator means transmits pseudo-random data packets with two double-intervaled binary elements at two predetermined instants t_1 and t_2 of each packet, said data regeneration circuit means including means for varying the threshold line by line from a maximum value to a minimum value, said receiver means also comprising a sampling clock means for providing a second frequency which is lower than the first frequency in a ratio of $(n-2)/n$, where n is equal to the integral ratio of the first frequency to the line frequency of the teletext television receiver, pseudo-random data reception circuit means for responding to said pseudo-random data packets, and means responsive to the middle of each video picture line for ensuring a resynchronization of the sampling clock means and said pseudo-random data reception circuit means, the output of said resynchronization means providing a digital signal for each detected error.

4,377,823
NOISE PROCESSING SYSTEM FOR A TELEVISION RECEIVER

Victor G. Mycynek, Des Plaines, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

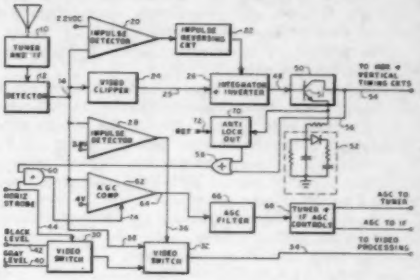
Filed Apr. 1, 1981, Ser. No. 249,793

Int. Cl.³ H04N *5/08, 5/21*

U.S. Cl. 358—157 **10 Claims**

8. In a television receiver which detects a composite video signal having a blank level and a gray level and which includes a path for processing video information derived from the composite video signal, a noise processing system for reducing impulse noise in the video processing path, comprising:

an impulse detector receiving the composite video signal for detecting noise pulses therein which extend beyond a selected video noise threshold and for generating a control signal upon the occurrence of each such detection; and



noise cancelling means receiving the control signal and the composite video signal for inserting into the video signal in response to the control signal a selected voltage level corresponding to a gray level during the receiver's active scan time and a different selected voltage during the receiver's blanking interval so as to replace impulse noise with the selected voltage levels and thereby generate a noise-processed video signal for application to the video processing path.

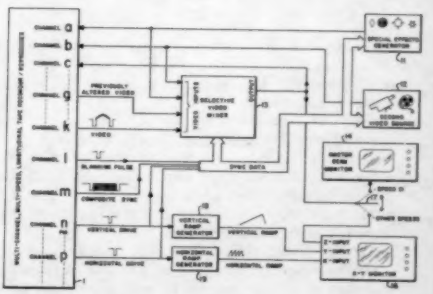
4,377,824
MULTI-CHANNEL LONGITUDINAL VIDEO TAPE RECORDING

Gilbert G. Kuperman, Dayton, and Donald E. Lewis, Montgomery County, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 115,845, Jan. 28, 1980, abandoned. This application Apr. 7, 1981, Ser. No. 251,696

Int. Cl.³ H04N *5/785*

U.S. Cl. 360—10.3 **9 Claims**



1. Apparatus for recording and reproducing with superimposition of video signals, comprising:

a multiple channel, longitudinal tape recorder/reproducer capable of video frequency recording and reproduction, including a principal video channel and a plurality of synchronization channels, said synchronization channels including a horizontal drive channel and a vertical drive channel, the vertical drive channel having modulation

means for accurately recording and reproducing low frequency vertical synchronization signals;

a video input to which is supplied a composite video signal, the apparatus having an initial record mode in which said video input is coupled to said principal video channel to record the picture signal, and means coupled to said video input during the initial record mode to extract the synchronization signals from said composite video signal and to record them on said synchronization channels, including means to separate the horizontal and vertical synchronization signals and to separately record them respectively to the horizontal and vertical drive channels; so that the picture and synchronization signals are in proper spatial registry on the same tape;

said apparatus further comprising a video mixer and additional video source means, and having an edit mode in which said principal channel and said synchronization channels are coupled for playback to input means of the video mixer, the synchronization channels being also coupled as inputs to the additional video source means, and the additional video source means has output means coupled to other input means of the video mixer, monitor means coupled to an output of the video mixer for visually displaying the combined video signal;

and further record means coupled to special channel means of said recorder/reproducer during said edit mode to simultaneously record a video signal including at least picture information from said additional video source, so that the signals on the special channel means are also in proper spatial registry on the same tape with said signals recorded on the principal and synchronization channels.

4,377,825

DATA CONTROL SYSTEM FOR STORING DIGITAL AND AUDIO INFORMATION ON A MAGNETIC TAPE

Takeshi Kasubuchi, Nara; Takeo Hara, Ikoma, and Kaoru Ozawa, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 806,483, Jun. 14, 1977. This application Dec. 19, 1980, Ser. No. 218,361

Claims priority, application Japan, Jun. 14, 1976, 51-70017; Jun. 14, 1976, 51-70018; Sep. 10, 1976, 51-109012

Int. Cl.³ G11B *5/09, 15/18*

U.S. Cl. 360—48 **4 Claims**

1. An electronic information processing apparatus capable of operating in a variety of different modes comprising:

means for introducing information into said information processing apparatus;

magnetic tape recorder means for recording said information onto a magnetic tape, said tape recorder means being capable of operating in a normal record mode, a playback mode, a fast forward and a fast rewind mode; and

control circuit means for controlling the recordation of said information onto said magnetic tape in a predetermined format, said format comprising:

a plurality of individual data sections having said information recorded therein, each of said data sections being separated from one another by a certain distance on said magnetic tape; and

a plurality of block number codes corresponding, respectively, to said plurality of data sections, said block number codes being indicative of the modes of operation of said information processing apparatus and the type of information recorded on said magnetic tape, each of said block number codes being interposed on said magnetic tape between two adjacent data sections, each of said block number codes including a first section, used in the normal record modes and the playback mode of said tape recorder means and a second section, directly adjacent said first section, used in the fast forward and fast rewind modes of said tape recorder means;

wherein said first section and said second section of said block number codes each comprise:

a first plurality of bits; and

a second plurality of bits directly adjacent to said first plurality of bits, said second plurality of bits being the same bits and containing the same information as said first plurality of bits;

whereby said block number codes on said magnetic tape are detectable by said magnetic tape recorder means when said magnetic tape is driven to travel in a forward direction and in a reverse direction;

wherein said first and second plurality of bits each comprise:

a bit for determining the type of said information being recorded on said magnetic tape; and

a bit to distinguish between a data write-in mode and a data read out mode of said electronic information processing apparatus.

4,377,826

METHOD FOR DETECTING A SPECIFIC RECORDING POSITION ON A RECORDING MEDIUM AND AN APPARATUS USING THIS METHOD

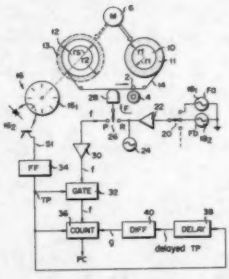
Kenji Furuta, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1980, Ser. No. 187,764

Claims priority, application Japan, Sep. 26, 1979, 54-123690

Int. Cl.³ G11B *15/18*

U.S. Cl. 360—72.1 **8 Claims**



1. Apparatus for detecting a specific recording position on a recording medium comprising:

first means for providing a plurality of cue signals containing mutually different frequency components;

second means coupled to said first means for recording one of said cue signals at a specific recording position on the recording medium;

third means coupled to said second means including a reel on which is wound said recording medium, and means for rotating said reel to cause said recording medium to travel by the rotation of said reel, thereby driving said recording medium;

fourth means coupled to said third means for providing a reel signal corresponding to the rotation of said reel;

fifth means coupled to said third means for reproducing a detected cue signal corresponding to said recorded one of said cue signal from said recording medium when said recording medium is driven by the rotation of said reel; and

sixth means coupled to said fourth and fifth means for counting the frequency components of said detected cue signal, taking said reel signal as a reference, and for generating

data which represents said specific position as a function of said counted frequency components.

4,377,827

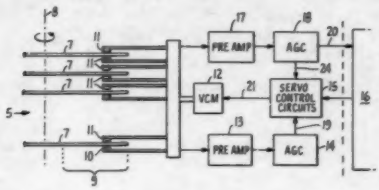
SERVO POSITIONING CONTROL SYSTEM FOR A DATA STORAGE APPARATUS

Andrew M. Rose, Mountain View, Calif., assignor to Memorex Corporation, Santa Clara, Calif.

Filed Nov. 10, 1980, Ser. No. 205,680

Int. Cl.³ G11B *21/10*

U.S. Cl. 360—78 **4 Claims**



1. A servo system in a disc drive for accessing a selected data track on a disc surface and for following said selected data track as the disc surface is rotated, wherein the disc surface having data information thereon also has servo information in sectors of said surface, said servo system having accessing means including a movable magnetic head coupled to an actuator that is responsive to a servo signal, comprising:

means for generating a first continuous position signal;

means for generating a second position signal, derived from servo information in sectors of said surface;

means for forming an output signal based upon said first signal and said second signal;

said output signal being said second signal when said second position signal is generated;

said output signal being the sum of a modified first position signal and a stored second position signal when said second position signal is not generated;

said modified first position signal being the difference between the first signal generated and the first signal generated when the second position signal was also generated;

said stored second position signal being said second position signal when the second position signal was generated; and

servo control circuit means for controlling the movement of said accessing means in response to said output signal.

4,377,828

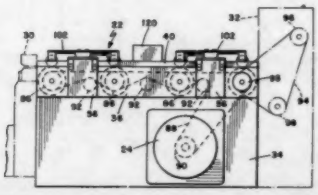
TICKET TRANSPORT

Charles L. Hayman, Riverside; John B. Roes, and Royal C. Moore, Jr., both of San Diego, all of Calif., assignors to Cubic Western Data, San Diego, Calif.

Filed Dec. 1, 1980, Ser. No. 211,023

Int. Cl.³ G11B *19/02, 25/04;* G06K *7/00*

U.S. Cl. 360—88 **13 Claims**



1. A ticket transport comprising:

means for defining a channel adapted to have a ticket propelled therethrough, including a lower ticket guide plate, an upper ticket guide plate, means for hingedly mounting the upper ticket guide plate for movement between a closed position in which it overlies the lower ticket guide plate to define the ticket channel therebetween and an open position in which the ticket channel is exposed, and releasable clasp means for holding the upper ticket guide plate in its closed position;

a transducer positioned adjacent the channel;

means for engaging and propelling the ticket through the channel;

a motor;

means for providing a driving connection between the motor and the engaging and propelling means; and

means for controlling the motor to cause the ticket to move past the transducer.

4,377,829

PLAYER FOR MAGNETIC TAPE CARTRIDGE RECORDINGS

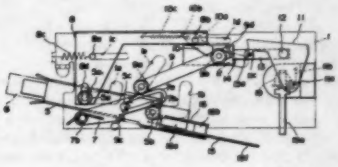
Teturo Kamimura; Masahiro Komatsubara; Shizuo Ando, and Takuzi Inanaga, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 29, 1980, Ser. No. 220,982

Claims priority, application Japan, Dec. 29, 1979, 54-171499; Dec. 29, 1979, 54-171500

Int. Cl.³ G11B *15/66, 15/26, 23/04*

U.S. Cl. 360—96.5 **14 Claims**



1. In a player for magnetic tape cartridge recording and playback operation comprising:

a chassis having a main surface;

a cartridge holder mounted for motion within said chassis and adapted to receive a tape cartridge from without said chassis at an initial oblique position with respect to the main surface; and

guide means associated with said cartridge holder and including at least one set of guide grooves, each including a first groove portion parallel to the main surfaces and a second groove portion extending from the first groove portion substantially perpendicularly thereto, said guide means allowing said cartridge holder to be translated into said chassis to an intermediate oblique position along the first groove portion and then turned from the intermediate oblique position to a position parallel to the main surface;

the improvement comprising:

ejecting means for urging said cartridge holder from the parallel position back to the intermediate oblique position along the second groove portion and further to the initial position along the first groove portion; and

control means for selectively retaining said ejecting means inoperative in response to the translational movement of said cartridge holder into the chassis.

4,377,830

COMBINATION MAGNETIC DISK STORAGE DEVICE AND FILTER SYSTEM

Dilip C. Patel, Oklahoma City, Okla., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Apr. 17, 1981, Ser. No. 255,311

Int. Cl.³ G11B *5/012;* B01D *46/10*

U.S. Cl. 360—98 **7 Claims**

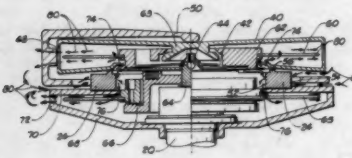
1. A combination magnetic disk storage device and air filter system for cleaning air in a housing, the storage device and air

filter system adapted for mounting on a drive spindle and receiving a read-write head adjacent thereto, the storage device and air filtering system comprising:

a first magnetic disk rotatably mounted on the drive spindle;

a first enclosure disposed around the first disk and the drive spindle, the first enclosure having a first opening in the side of the first enclosure adjacent the outer circumference of the first disk, the first opening adapted for receiving the read-write head therethrough and recording and receiving data from the first disk, the first opening also used for discharging air from the first enclosure when the first disk is rotated therein and a second opening in the top of the first enclosure and adjacent the inner circumference of the first disk;

a second magnetic disk rotatably mounted on top of the drive spindle;



a second enclosure disposed around the second disk, the second enclosure having a third opening in the side of the second enclosure adjacent the outer circumference of the second disk, the third opening adapted for receiving a read-write head therethrough and recording and receiving data from the second disk, the third opening also used for discharging air from the second enclosure when the second disk is rotated therein and a fourth opening disposed in the bottom of the second enclosure and adjacent the inner circumference of the second disk; and

an annular shaped air filter having an inner and outer circumference, the air filter received on top of the first enclosure and against the bottom of the second enclosure and providing a seal therebetween, the second and the fourth opening disposed adjacent the inner circumference of the filter for receiving filtered air therethrough as the air is circulated out of the first and third openings.

4,377,831

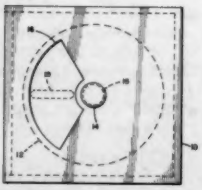
NON-ABRASIVE MAGNETIC HEAD CLEANING SYSTEM

C. Paul Davis, Woodland Hills, and Joseph Sandor, Reseda, both of Calif., assignors to Innovative Computer Products Corp., Tarzana, Calif.

Continuation of Ser. No. 20,808, Mar. 15, 1979, abandoned. This application Feb. 13, 1981, Ser. No. 234,576

Int. Cl.³ G11B *5/41*

U.S. Cl. 360—128 **17 Claims**



1. A system for cleaning magnetic heads in flexible disk systems, comprising:

a cleaning disk made of an absorbent and porous material, and adapted to be saturated with a liquid cleaning fluid; and

a flat jacket rotatably supporting said cleaning disk within its interior, said jacket including at least one opening for exposing said cleaning disk to the magnetic head of a flexible disk system, said opening exposing at least one eighth of the surface of said cleaning disk so as to facilitate saturation of the appropriate area of said cleaning disk with cleaning fluid without requiring removal of said disk from said jacket.

4,377,832

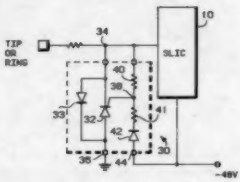
VOLTAGE TRANSIENT SUPPRESSOR CIRCUIT

John J. Toney, Scottsdale, and Leland T. Brown, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 9, 1981, Ser. No. 223,628

Int. Cl.³ H02H *3/20*

U.S. Cl. 361—56 **4 Claims**



1. In combination with subscriber carrier equipment including a battery source, the equipment being adapted to be coupled to a two-wire balanced subscriber loop, a circuit for protecting the equipment from negative voltage transients comprising a silicon controlled rectifier (SCR) having anode, cathode and gate electrodes, said anode electrode being coupled to a terminal at which is supplied earth potential, said cathode being coupled to one of said two wires of said balanced subscriber loop to the subscriber carrier equipment, said gate being coupled to an interconnect node; diode means coupled between said interconnect node and a terminal adapted to be coupled to the battery source; and circuit means for coupling said interconnect node to said one of said two wires; said SCR being rendered responsive to the negative voltage transients for directly shunting the transients to earth potential.

4,377,833

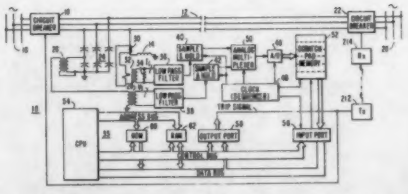
METHODS AND APPARATUS FOR PROTECTING ELECTRICAL REACTORS

Eric A. Udren, Monroeville, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Aug. 17, 1981, Ser. No. 293,536

Int. Cl.³ H02H *3/40*

U.S. Cl. 361—79 **28 Claims**



11. Apparatus for protecting an electrical reactor connected to a source of alternating potential via a circuit breaker, comprising:

first means for providing voltage and current signals responsive to the voltage across, and the current through the electrical reactor,

second means responsive to said first means for providing

signals indicative of the apparent impedance of the electrical reactor,

third means responsive to said second means for providing a signal responsive to the rate of change of the apparent impedance,

and fourth means responsive to said third means for providing a trip signal for the circuit breaker when the rate of change of a drop in apparent impedance falls within a predetermined range.

4,377,834

MULTIPHASE BLOCKING CIRCUITRY FOR ELECTRICAL POWER SUPPLY NETWORKS

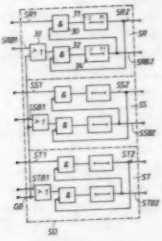
Leif Eriksson, Sala, Sweden, and Salomon Liberman, Ra'anana, Israel, assignors to Asea Aktiebolag, Vasteras, Sweden

Continuation-in-part of Ser. No. 964,201, Nov. 28, 1978, abandoned. This application Jun. 1, 1979, Ser. No. 44,389

Claims priority, application Sweden, Nov. 28, 1977, 7713410

Int. Cl.³ H02H *3/26*

U.S. Cl. 361—82 **4 Claims**



1. Circuitry for generating tripping and blocking signals for the protection of electrical components included in a three-phase electrical power supply network as a result of the occurrence of faults therein, comprising:

separate direction determining means for each of the phases of the network, each of said direction determining means including means for determining, in response to measurement of the voltage and current associated with travelling waves generated by a fault at a single measuring point of the affected phase, whether the fault lies ahead of or behind the measuring point, and for generating a tripping signal upon occurrence of a fault which lies ahead of the measuring point and a blocking signal upon occurrence of a fault which lies behind the measuring point;

said direction determining means being supplied with measured values of voltage and current of said phase at said measuring point, and further including filtering means for suppressing network frequency components in said measured values;

polarity sensing means responsive to the output of said filtering means for generating said tripping and blocking signals in dependence on the polarity of the output of the filtering means;

separate sequence detecting means for each of the phases of the network, each of said sequence detecting means being associated with one of said phases and connected to the direction determining means associated with the same phase for receiving the tripping and blocking signals therefrom and blocking any incoming tripping signals in response to a blocking signal to prevent tripping in said one phase for faults occurring behind the measuring point.

4,377,835

RECOVERY PROTECTION DEVICE FOR A THYRISTOR VALVE

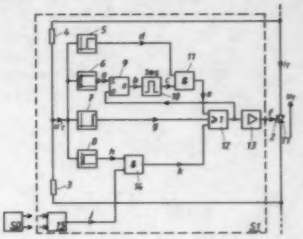
Gunnar Asplund; Lars Eklund, both of Ludvika, and Bernt Östlund, Västerås, all of Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Jun. 29, 1981, Ser. No. 278,020

Claims priority, application Sweden, Jul. 7, 1980, 8004989

Int. Cl.³ H02H *7/127*

U.S. Cl. 361—91 **2 Claims**



1. In a thyristor valve having a plurality of series-connected thyristors, an individual recovery protection device for each of said thyristors operating at the potential of a respective thyristor, comprising:

a first voltage sensor for providing a first signal when the reverse voltage across said thyristor exceeds a first reference level;

a second voltage sensor for providing a second signal when the off state voltage across said thyristor exceeds a second reference level;

a bi-stable circuit having a set input connected to receive said first signal, and a reset input;

a monostable circuit connected to receive an input signal from said bi-stable circuit, whereby an output pulse of fixed duration is produced;

an AND circuit having a first input connected to receive said monostable circuit output pulse, and a second input connected to receive a signal from said second voltage sensor;

an OR circuit having a first input connected to receive an output signal from said AND circuit, and a second input for receiving an input signal for simultaneously igniting the thyristors of said valve; said OR circuit providing an output signal to said bi-stable circuit reset input; and

means for generating a control signal for igniting said thyristor in response to said OR circuit output signal.

4,377,836

CIRCUIT INTERRUPTER WITH SOLID STATE DIGITAL TRIP UNIT AND POSITIVE POWER-UP FEATURE

Robert T. Elms, Monroeville; Gary F. Saletta, Irwin, and Bernard J. Mercier, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 15, 1980, Ser. No. 140,632

Int. Cl.³ H02H *3/10*

U.S. Cl. 361—96 **14 Claims**

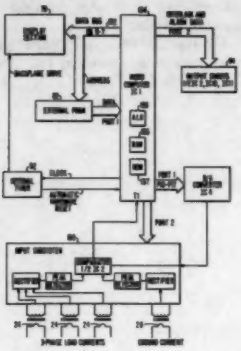
1. Circuit interrupter apparatus, comprising:

interrupter means for conducting alternating current flow through a circuit to be protected and for operating to interrupt current flow therethrough upon command;

sensing means disposed in appropriate relationship with said interrupter means for sensing interrupter means alternating current and for providing a digital signal which is related to said current, said sensing means including a peak detector which senses the peak value of said alternating current, said digital signal being related to said peak value, said sensing means including reset means for resetting said peak detector;

and

digital processor means connected to said sensing means to receive said digital signal and to reset said peak detector



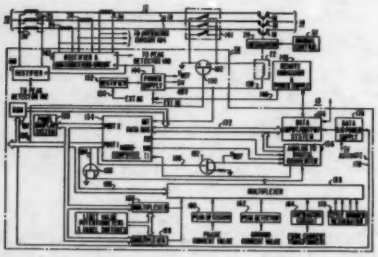
once each cycle of said alternating current and connected to said interrupter means for operating said interrupter means when said digital signal attains a predetermined value.

4,377,837

CIRCUIT INTERRUPTER WITH OVERTEMPERATURE TRIP DEVICE

Joseph J. Matsko, and John A. Wafer, both of Beaver, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 15, 1980, Ser. No. 140,504
Int. Cl.³ H02H 5/04
U.S. Cl. 361—105 13 Claims



1. A circuit interrupter, comprising:

separable contacts;

conductor means for connecting said contacts to an associated circuit;

a mechanism operable when actuated to automatically separate the contacts;

means operable when energized to actuate said mechanism;

means for energizing said actuating means;

a housing enclosing said interrupter; and

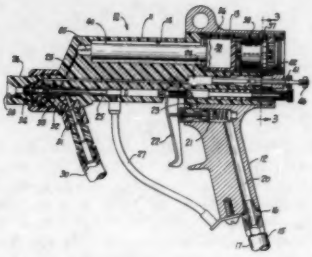
thermally responsive means within said housing physically connected to said conductor means and electrically connected to said actuating means and said energizing means for causing said energizing means to energize said actuating means whenever the temperature of said conductor means rises above a predetermined level, whereby said contacts are automatically separated.

4,377,838

ELECTROSTATIC SPRAY GUN APPARATUS

Gustave S. Levey; Clarence C. Reeves, both of Houston, and Donald R. Owens, Baytown, all of Tex., assignors to Speeflo Manufacturing Corporation, Houston, Tex.

Filed Nov. 17, 1980, Ser. No. 207,702
Int. Cl.³ B05B 5/02
U.S. Cl. 361—228 13 Claims



1. An electrostatic spray gun comprising, in combination,

a hand-manipulable frame,

an air turbine carried in said frame and operable from an external air supply at a speed in the order of 60,000 rpm,

an alternator carried in said frame and directly coupled to said turbine to generate an alternating voltage in the order of 50 volts at about 1000 Hz,

a step-up transformer carried in said frame and connected to said alternator to transform the voltage thereof into a secondary voltage in the order of 2500 volts at the said about 1000 Hz, and

a long chain series voltage multiplier including capacitors and carried in said frame and connected to said transformer to increase the voltage thereof to one in the order of 45-70 Kv,

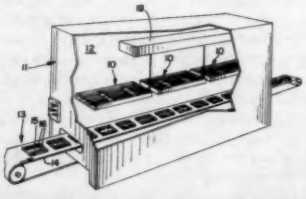
the combination of said transformer and said capacitors establishing a direct voltage output from said voltage multiplier with an alternating voltage ripple in excess of fifteen percent.

4,377,839

ENERGY TRANSFER APPARATUS

Oscar C. Blomgren, Jr., Lake Forest, and Henry A. Renken, Lake Bluff, both of Ill., assignors to Inter-Probe, Inc., North Chicago, Ill.

Continuation-in-part of Ser. No. 111,610, Jan. 14, 1980, abandoned. This application Jul. 13, 1981, Ser. No. 282,427
Int. Cl.³ F24F 3/12; H01T 19/04
U.S. Cl. 361—233 32 Claims



1. Apparatus for effecting electrostatic transfer of energy to a target comprising, an elongated probe strip of electrically conductive material having a plurality of spaced apart points therealong facing the target, at least two elongated spaced apart grid wires of electrically conductive material in spaced relation to said points and electrically insulated therefrom, said wires being arranged symmetrically to the points and of equal

spacing therefrom and disposed between the points and the target, means for supporting said probe strip and grid wires in electrically insulated relationship from each other and to permit independent expansion and contraction of the probe strip and wires, and a source of high voltage low amperage direct current connected across the probe strip and grid wires.

4,377,840

SCREEN-PRINTABLE DIELECTRIC COMPOSITION

Kumaran M. Nair, East Amherst, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 169,496, Jul. 16, 1981, abandoned. This application Mar. 24, 1982, Ser. No. 361,263

Int. Cl.³ C04B *35/46*

U.S. Cl. 361—320 **14 Claims**

1. A dielectric powder composition for making hermetic dielectrics having an insulation resistance (IR) drop of less than 4 orders of magnitude after submersion in water at 50° C. for 10 days consisting essentially of a finely divided admixture of (a) a perovskite of the formula $ATiO_3$ in which is A is selected from the group consisting of barium, calcium, strontium and lead, (b) a bismuth-substituted pyrochlore of the formula $Bi_{2-x}M_xM'_{2-y}M''_yO_{7-z}$ wherein

M is a rare earth metal of atomic number 57 to 71, lead, cadmium, or yttrium

M' is iron, gallium or indium

M'' is antimony, tantalum or niobium,

X is a number in the range 0–1,

y is a number in the range 1–1.5 and

Z is a number in the range 0–0.5 and

(c) a low temperature-melting devitrifiable glass having a specific viscosity (log η) of less than 6 at the firing temperature in which the glass has a softening point below 600° C. and in which the relative proportions of the components, by weight, are 10–65% (a) 10–70% (b) and 1–20% (c).

5. A screen-printable dielectric composition for making hermetic dielectrics having an insulation resistance (IR) drop of less than 4 orders of magnitude after submersion in water at 50° C. for 10 days consisting essentially of (a) a perovskite of the formula $ATiO_3$ in which is A is selected from the group consisting of barium, calcium, strontium and lead, (b) a bismuth-substituted pyrochlore of the formula $Bi_{2-x}M_xM'_{2-y}M''_yO_{7-z}$ wherein

M is a rare earth metal of atomic number 57 to 71, lead, cadmium, or yttrium

M' is iron, gallium or indium

M'' is antimony, tantalum or niobium,

X is a number in the range 0–1,

y is a number in the range 1–1.5 and

Z is a number in the range 0–0.5 and

(c) a low temperature-melting devitrifiable glass having a specific viscosity (log η) of less than 6 at the firing temperature dispersed in an inert liquid vehicle in which the glass has a softening point below 600° C. and in which the relative proportions of the components, by weight, are 10–65% (a) 10–70% (b) and 1–20% (c).

13. An hermetic capacitor having an insulation resistance (IR) drop of less than 4 order of magnitude after submersion in water at 50° C. for 10 days and comprising (1) a first conductor terminal on which is printed (2) an hermetic dielectric film and (3) a second conductor terminal overlying the dielectric film, the dielectric layer consisting of (a) a perovskite of the formula $ATiO_3$ in which is A is selected from the group consisting of barium, calcium, strontium and lead, (b) a bismuth-substituted pyrochlore of the formula $Bi_{2-x}M_xM'_{2-y}M''_yO_{7-z}$ wherein

M is a rare earth metal of atomic number 57 to 71, lead, cadmium, or yttrium

M' is iron, gallium or indium

M'' is antimony, tantalum or niobium,

X is a number in the range 0–1,

y is a number in the range 1–1.5 and

Z is a number in the range 0–0.5 and

(c) a low temperature-melting devitrifiable glass, having a specific viscosity (log η) of less than 6 at the firing temperature the assemblage having been cofired to remove the inert liquid therefrom and to effect liquid phase sintering and then cooled to effect devitrification of the glass in which the glass has a softening point below 600° C. and in which the relative proportions of the components, by weight, are 10–65% (a) 10–70% (b) and 1–20% (c).

4,377,841

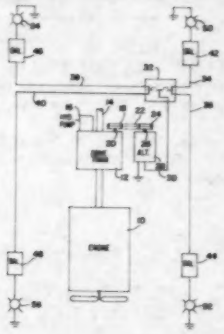
HIGH INTENSITY DISCHARGE LIGHTING SYSTEM

Laurence J. Kukla, Waukegan, Ill., assignor to International Harvester Co., Chicago, Ill.

Filed Dec. 11, 1979, Ser. No. 102,492

Int. Cl.³ B60Q *1/02*

U.S. Cl. 362—80 **4 Claims**



1. In a self-propelled mobile land vehicle including a work implement carried on the vehicle, an engine having a substantial range of operating speeds, including high idle speed, rated speed and peak torque speed, in response to the load imposed thereon, a drive train for propelling the vehicle operatively associated with and driven by said engine, a hydraulic pump driven by said engine and operatively associated with said engine and operatively associated with said implement, an alternator driven by said engine for supplying alternating current at a frequency directly proportional to the speed of said engine, and a lighting system mounted on said vehicle and having lamps with ballasts electrically powered directly connected to by said alternator, the improvement wherein the lamps used in said lighting system comprised high intensity discharge lamps, said lamps being operable continuously throughout the entire range of the operating speeds of said engine.

4,377,842

FLYBACK VOLTAGE CONTROL

Craig S. Cambier, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

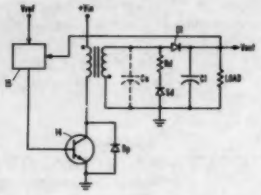
Filed Oct. 6, 1980, Ser. No. 194,191

Int. Cl.³ H02M *3/335*

U.S. Cl. 363—20 **7 Claims**

1. In a power supply of the flyback type including transformer means having primary circuit means and secondary circuit means for inducing a voltage in said secondary circuit means in response to current action in said primary circuit means, switching means coupled to said primary circuit means for completing, when activated, a current path in said primary circuit means, and control means for alternately activating and

deactivating said switching means, the improvement comprising:



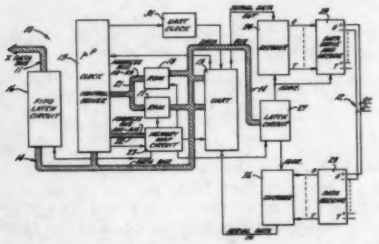
damping means coupled across said secondary circuit means for damping oscillations therein caused by stray capacitance while said switching means is activated.

4,377,843

DATA DISTRIBUTION INTERFACE

Roy T. Garringer, Wheaton, and Lacrence G. Gierut, Lockport, both of Ill., assignors to Wescom Switching, Inc., Downers Grove, Ill.

Filed Apr. 19, 1979, Ser. No. 31,374
Int. Cl.³ G06F *3/00*
U.S. Cl. 364—200 **16 Claims**



1. A data distribution interface between a plurality of remote serial data terminals and a central parallel data transmission system comprising:

an asynchronous receiver transmitter operable to convert serial data at a serial data input to parallel data at a parallel data output and also operable to convert parallel data at a parallel data input to serial data at a serial data output;

a parallel data bus connected to the parallel data input and output of the asynchronous receiver-transmitter for transmitting parallel data to and from said receiver-transmitter,

multiplexer means coupled to the serial data input of the asynchronous receiver-transmitter and to the plurality of remote serial data terminals for coupling data from said terminals to the serial data input of the asynchronous receiver-transmitter;

demultiplexer means coupled to the serial data output of the asynchronous receiver-transmitter and to the plurality of remote serial data terminals for coupling data from the serial data output of the asynchronous receiver-transmitter to said terminals;

a memory coupled to said parallel data bus

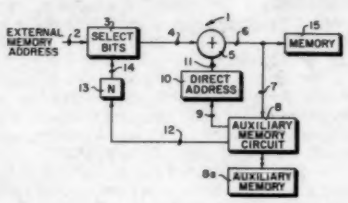
microprocessor means connected to said receiver-transmitter and said data bus for reading and processing data from the data bus and sending resultant data to the memory, for supplying said multiplexer and demultiplexer means with data representing the addresses of selected remote terminals to which data is to be transmitted and from which data is to be received, and for enabling said receiver-transmitter to supply data to said demultiplexer via said serial data output and to receive data from said multiplexer via said serial data input.

4,377,844

ADDRESS TRANSLATOR

Marc Kaufman, 14100 Donelson Pl., Los Altos Hills, Calif. 94022

Filed Feb. 20, 1980, Ser. No. 122,836
Int. Cl.³ G06F *7/00*
U.S. Cl. 364—200 **8 Claims**



1. A memory translating apparatus comprising:

means for coupling said apparatus to an external source of memory addresses and an external memory;

means storing a predetermined sequence of memory addresses;

means responsive to said predetermined sequence and a signal corresponding to a first memory address received from said source, said first memory address from said source being a first memory address in said sequence, for providing an output corresponding to the next memory address in said sequence following said first memory address in said sequence; and

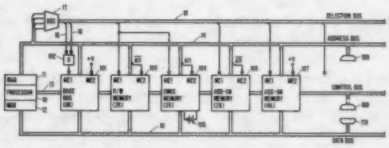
means responsive to said output and a second memory address from said external source for addressing said external memory when said second memory address corresponds to said next memory address in said sequence.

4,377,845

OPTIONAL MACHINE INHIBITION FOR FEATURE MALFUNCTION

Harvey R. Markham, Westminster, Colo., and Paul R. Spivey, Winchester, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 29, 1980, Ser. No. 192,118
Int. Cl.³ G06F *11/00*
U.S. Cl. 364—200 **5 Claims**



1. In a method for adding programming code to an existing main program for controlling a machine where the add-on code is stored in a second memory module separate from a first memory module in which the main program is stored and the first addressable location of the second memory module stores a test word equal to a reference word, the improvement comprising the steps of:

storing a flag in a referenced location of the second memory module, said flag having one value if the add-on program is essential to the continued operation of the machine and having another value if said machine can be operated without said add-on program;

testing said second memory module to determine whether said second module is operable;

executing the add-on program if said testing step determines the add-on program to be operable, otherwise

checking the flag to determine whether said add-on program is essential;

inhibiting the operation of the machine if said add-on program is determined to be essential; and

continuing execution of the main program if said add-on program is determined not to be essential.

4,377,846

ARITHMETIC UNIT FOR GENERATING CONSTANTS IN AN ELECTRONIC COMPUTER OF THE MICROPROGRAM-CONTROLLED TYPE

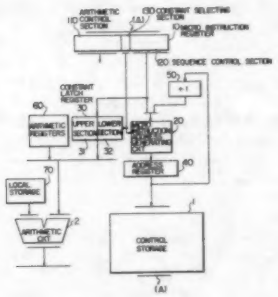
Kazufumi Yoshida, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 7, 1980, Ser. No. 194,814

Claims priority, application Japan, Oct. 8, 1979, 54-129637

Int. Cl.³ G06F 9/22, 9/32

U.S. Cl. 364—200 **8 Claims**



1. An arithmetic unit for use in an electronic computer of the microprogram-control type, comprising

control storage means for storing therein a micro instruction including an arithmetic control section for controlling an arithmetic operation, a sequence control section for controlling the sequence of the execution of microprograms and a constant selecting section for specifying the use of said sequence control section for the generation of an arithmetic constant;

micro instruction holding means for holding a micro instruction read out from said control storage means;

constant latch means for receiving and holding an arithmetic constant in the form of said sequence control section, when the generation of an arithmetic constant is specified by said constant selecting section of the micro instruction held by said holding means;

means for uniquely determining the sequence of the execution of microprograms on the basis of the current address when the generation of an arithmetic constant is specified by said constant selecting section; and

arithmetic calculator means for arithmetically treating the arithmetic constant held in said constant latch means under control of said arithmetic control section of the micro instruction held by said holding means.

4,377,847

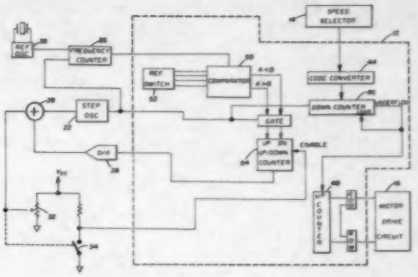
MICROPROCESSOR CONTROLLED MICRO-STEPPING CHART DRIVE

Richard A. Daniel, Lakewood, and Ronald J. Geil, Vermilion, both of Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Filed Feb. 17, 1981, Ser. No. 234,975

Int. Cl.³ G06F 15/46; G05B 19/40

U.S. Cl. 364—400 **4 Claims**



1. A micro-stepping control circuit for a stepper motor of the type used to drive the chart within an oscillographic recorder, said micro-stepping control circuit comprising:

a speed selector means for selecting the speed at which said stepper motor will drive said chart;

a step oscillator means for providing a step frequency pulse signal;

a controller means, said controller means being operatively connected to said speed selector means and said step oscillator means, said controller internally generating a numerical constant whose value is determined by the speed selector means, said numerical constant being either decremented or incremented by at least one pulse from said step oscillator means, said controller means determining if said numerical constant has reached to some predetermined value and then generating a signal indicative thereof; and

drive means operatively connected to said controller means and said stepper motor for driving said stepper motor with a full wave rectified sine and cosine signal broken into staircase increments, said drive means being updated whenever said controller means determines that said numerical constant reaches said predetermined value wherein update for said drive means provides a incremental part of a full step of said stepper motor.

whereby said chart speed is determined by said numerical constant and the time it takes to reach said predetermined value.

4,377,848

ALTITUDE CAPTURE MODE FOR AIRCRAFT AUTOMATIC FLIGHT CONTROL SYSTEM

James B. Flannigan, Scottsdale; Jack E. Emfinger, and Thomas R. Elliott, both of Phoenix, all of Ariz., assignors to Sperry Corporation, New York, N.Y.

Filed Oct. 16, 1980, Ser. No. 197,735

Int. Cl.³ G06F 15/50; G06G 7/78

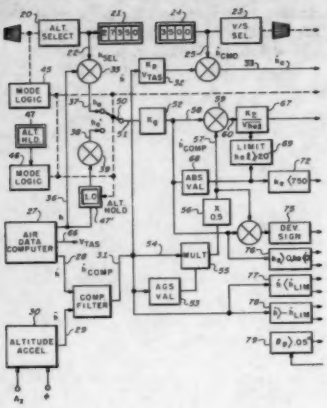
U.S. Cl. 364—433 **10 Claims**

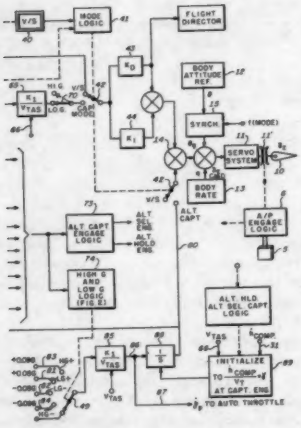
1. Automatic pilot apparatus for controlling an aircraft to execute a maneuver to capture a predetermined altitude comprising:

means for generating a control law signal representative of a circular flight path tangentially intercepting said predetermined altitude and resulting in a first predetermined normal acceleration force on said aircraft;

means for generating a predictive pitch attitude signal based

on a signal representative of said first predetermined normal acceleration force on said aircraft, and





means for combining said control law signal and said predictive pitch signal to provide a pitch attitude command signal for controlling said aircraft to execute said altitude capture maneuver.

4,377,849

MACRO ASSEMBLER PROCESS FOR AUTOMATED CIRCUIT DESIGN

Wesley C. Finger, Saugerties, N.Y., and Gerald B. Long, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1980, Ser. No. 221,150
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—491 **4 Claims**

1. A multipass process for automatically generating topologies for fabricating large scale integrated circuits comprising the steps of:

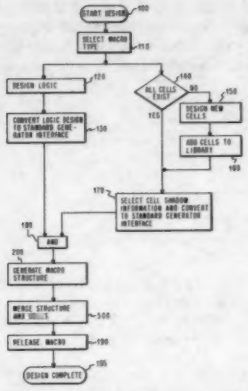
(a) inputting electrical and functional data relative to the logic technology used;

(b) calculating a logical map of the desired logic function;

(c) designing a plurality logic cells representative of functional logic components;

(d) dividing said plurality of logic cells into a plurality of basic cell components having a plurality of common elements;

(e) selecting said basic cell components in accordance with the calculated logical map of the desired logic function;



(f) concatenating the selected basic cell components into a plurality of intermediate level cells representing components of the desired logic function, and

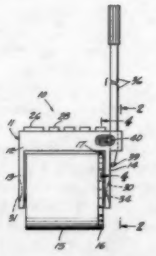
(g) concatenating said plurality of intermediate cells into a prime cell representing desired logic function.

4,377,850

HAND-HELD MEASURING AND CALCULATING DEVICE

Roy Simpson, 3936 El Rovia Ave., El Monte, Calif. 91731

Filed Jun. 23, 1977, Ser. No. 809,183
Int. Cl.³ G01B *3/12*
U.S. Cl. 364—561 **8 Claims**



1. A self-contained hand-held measuring and calculating device comprising:

a housing rotatably supporting roller means positioned for and driven by rolling contact with a surface to be measured;

miniature electronic calculator means mounted in said housing provided with digital readout display means and connected to a constant value integrating circuit controlled by an activating switch operable to close said circuit on each operation of said switch; and

non-electrical mechanical camming means on said roller means operable to actuate said switch each time said roller means rotates through an equal value increment in the same direction and thereby effective to display on said display means the aggregate number of increments of

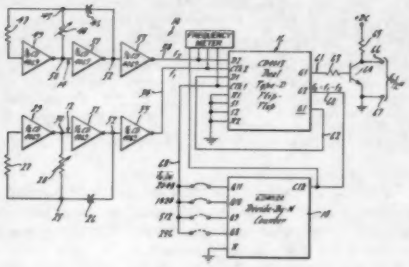
rotation of said roller means over a surface undergoing measurement.

4,377,851

METHOD FOR CALIBRATING A TRANSDUCER FOR CONVERTING PRESSURE VARIATION TO FREQUENCY VARIATION

David A. McNamara, Ypsilanti, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 22, 1980, Ser. No. 219,128
Int. Cl.³ G01L 25/00
U.S. Cl. 364—571 **5 Claims**



1. A method for calibrating a transducer for converting a pressure variation to a variation in the frequency of an output periodic function, the transducer including a reference signal processing means and a sensor signal processing means as inputs to a mixer signal processing means, the reference signal processing means generating a periodic reference electrical signal as a function of a reference timing capacitor and a reference resistor, the sensor signal processing means generating a periodic sensor electrical signal as a function of a variable sensor timing capacitor responsive to pressure changes and a sensor resistor, the mixer signal processing means generating a mixed periodic electrical signal having a frequency proportional to the difference between the reference and sensor electrical signals, said method including the steps of:

applying a first reference pressure to the transducer and measuring a first sensor signal frequency;

applying a second reference pressure to the transducer and measuring a second sensor signal frequency;

measuring the reference signal frequency during at least one of the applications of the first reference pressure or the second reference pressure;

calculating the actual, uncalibrated transfer function defining the mixed signal frequency as a function of pressure;

altering the slope of the actual transfer function to a desired, calibrated slope by changing the magnitude of the sensor resistor; and

altering the frequency axis intercept to a desired, calibrated frequency intercept by changing the magnitude of the reference resistor.

4,377,852

TERMINAL EMULATOR

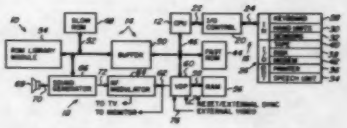
E. Earle Thompson, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 31, 1980, Ser. No. 135,576
Int. Cl.³ G06F 7/00
U.S. Cl. 364—900 **25 Claims**

1. A plug-in communications control program module for use in a digital computing system including a central processing unit, a communications interface means, a memory means, a video display system and a plug-in type port for temporarily receiving a plug-in program control module, said plug-in communications control module comprising:

a connector means connectable to said plug-in type port; and

a solid state read only memory means having permanently stored therein a control program for interaction with said central processing unit of said digital computing system, said central processing unit and said plug-in communications control module together comprising (a) means for defining said memory means into at least a temporary data input buffer, a display memory means and a received line memory means having a greater size than said display memory means, (b) means for storing data characters received by said communications interface means in said temporary data input buffer, (c) means for periodically



determining if at least one data character has been stored in said temporary data input buffer, (d) means for reading data characters out of said temporary data input buffer when it has been determined that at least one data character has been stored in said temporary data input buffer until all data characters stored in the temporary data input buffer have been read out, (e) means for storing data characters read out of said temporary data input buffer in said display memory means in a predetermined sequence, and (f) means for storing data characters read out of said temporary data input buffer in said received line memory means in sequential memory locations as said data characters are read out.

4,377,853

PERIPHERAL CONTROLLER WITH SEGMENTED MEMORY BUFFER FOR INTERFACING 80 COLUMN CARD READER WITH HOST COMPUTER

Ronald J. Dockal, San Clemente, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sep. 9, 1980, Ser. No. 185,489
Int. Cl.³ G06F 3/00, 5/00
U.S. Cl. 364—900 **11 Claims**

1. In a peripheral controller which interfaces a card reader peripheral mechanism to a host computer wherein said peripheral controller provides logic means to execute commands from said host computer and to return signals as to completion-/incompletion of each command operation, said logic means including microcode sequencing means, and address data means, and wherein said card-reader peripheral mechanism reads cards having punched data in 12 rows and 80 columns, a memory buffer-translator circuit means comprising:

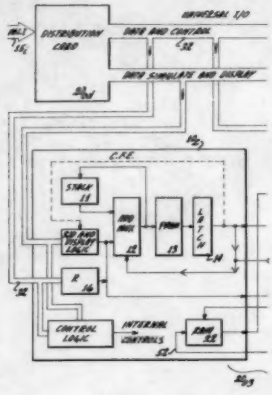
(a) op-decoder means for receiving command and control data from said host computer, said op decoder functioning

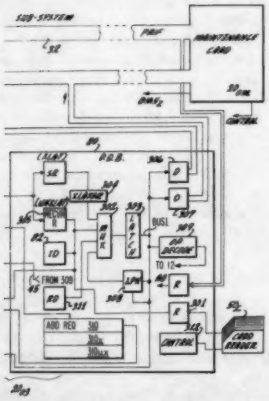
to select microcode routines from said microcode sequencing means;

(b) means for receiving card data from said card-reader peripheral mechanism, said card data being stored in a first dedicated portion of a RAM buffer memory;

(c) a RAM buffer memory for temporary storage of data from said card-reader and/or from said host computer; said buffer memory including:

(i) a first dedicated portion of memory for storage of raw untranslated data received from said card-reader mechanism and for later transmittal to a translation means;





(ii) a second dedicated portion of memory for storage of translated data received from a translation means and for later transmittal to said host computer;

(iii) a third portion of memory for storage of data from said host computer;

(d) means to receive address data to address selected areas of said RAM buffer memory, said address data provided from said logic means;

(e) translation means to translate data from said first dedicated portion of said RAM buffer memory into a selected format for placement in said second dedicated portion of said buffer memory.

4,377,854

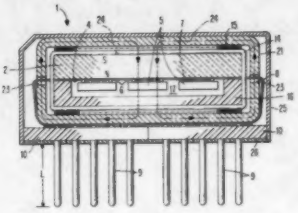
SUBSTRATE FOR MAGNETIC DOMAIN DEVICE

Roland J. Braun, Vestal; Gary R. Carden, Endwell, and Keith A. Snyder, Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 51,926, Jun. 25, 1979, abandoned. This application Jul. 18, 1980, Ser. No. 170,303

Int. Cl.³ G11C *5/04, 19/08*

U.S. Cl. 365—2 **11 Claims**



1. In field-accessed magnetic domain device package apparatus, said apparatus having plural input/output package terminals and a rotational magnetic field coil system associated therewith, the combination comprising:

magnetic ceramic first member means for providing a magnetic bias field source,

plural conductors directly affixed to and supported by said first member means,

at least one magnetic domain device having plural input-/output device terminals, said first member means supporting said magnetic domain device in a predetermined superimposed relationship thereto by selectively bonding said input/output device terminals to said plural conductors, said plural conductors being further selectively coupled to said input/output package terminals, magnetic circuit second member means coacting with said first member means to provide a magnetic bias field for said domain device, and

insulator carrier third member means for carrying said input-/output package terminals, said third member means being external to said second member means.

4,377,855

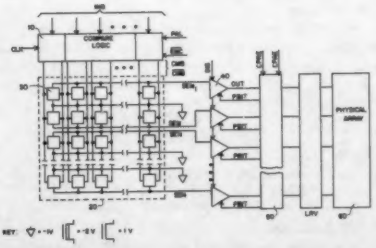
CONTENT-ADDRESSABLE MEMORY

Yoav Lavi, Raanana, Israel, assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Nov. 6, 1980, Ser. No. 204,685

Int. Cl.³ G11C *15/00*

U.S. Cl. 365—49 **12 Claims**



1. A content addressable memory having an array of memory cells comprising:

a first sense line associated with a first plurality of memory cells associated with a stored data word;

a ground line;

each memory cell comprising a first transistor coupled to the sense line and a second transistor serially coupled between the first transistor and the ground line, a third transistor coupled to the sense line and a fourth transistor serially coupled between the third transistor and the ground line, wherein the node between the first and second transistors is coupled to the gate of the fourth transistor and the node between the third and fourth transistors is coupled to the gate of the second transistor;

first and second compare line means for providing compare signals in response to a data bit of an address to be compared to the stored data word, the first compare line means coupled to the gate of the first transistor and the second compare line means coupled to the gate of the third transistor; and

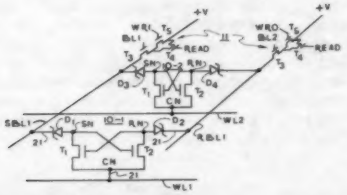
means for providing a match signal in response to sensing no current on the first sense line.

4,377,856

STATIC SEMICONDUCTOR MEMORY WITH REDUCED COMPONENTS AND INTERCONNECTIONS

Bruce B. Roesner, San Diego, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 15, 1980, Ser. No. 178,301
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—154 **13 Claims**



1. An improved static semiconductor memory comprised of a plurality of memory cells; each of said memory cells including a pair of cross-coupled switching means forming a set node, a reset node, and a common node; a plurality of word lines coupled respectively to the common node of said memory cells; a set bit line coupled to the set nodes of said cells; and a reset bit line coupled to the reset nodes of said cells; wherein the improvement comprises:

a first plurality of diodes having respective anodes connected directly to the set node of said cells and having respective cathodes connected directly to said set bit line;

a second plurality of diodes having respective anodes connected directly to the reset node of said cells and having respective cathodes connected directly to said reset bit line;

said diodes being the only coupling between said bit lines and said set and reset nodes;

said diodes having a predetermined reverse bias breakdown voltage level; and

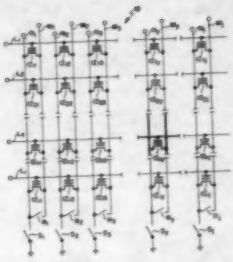
means for applying a reverse bias voltage between a selected one of said bit lines and a selected one of said word lines which exceeds said breakdown voltage to write information into the memory cell that connects to the selected word line.

4,377,857

ELECTRICALLY ERASABLE PROGRAMMABLE READ-ONLY MEMORY

Andrew C. Tickle, Los Altos, Calif., assignor to Fairchild Camera & Instrument, Mountain View, Calif.

Filed Nov. 18, 1980, Ser. No. 207,859
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—185 **34 Claims**



1. An electrically erasable programmable read-only memory comprising:

(a) a memory array comprising

(i) a matrix of memory cells formed as a plurality of rows and a plurality of columns of said cells, each of said cells utilizing a floating gate field effect transistor for storage of binary data;

(ii) a plurality of word lines, the control gate of each said transistor in a row of said memory cells being connected to a word line corresponding to said row;

(iii) a plurality of bit lines, the drain of each said transistor in a column of said memory cells being connected to a bit line corresponding to said column; and

(iv) a plurality of source lines, the source of each said transistor in a column of said memory cells being connected to a source line corresponding to said column;

(b) means for applying an erase voltage to a selected word line and, simultaneously, maintaining unselected word lines as well as all bit lines and all source lines at zero potential such that the floating gate of each said transistor connected to said selected word line is charged to a high threshold voltage;

(c) means for maintaining a selected word line at zero potential and, simultaneously, applying an inhibit voltage which is less than said erase voltage to unselected word lines, applying a write voltage to selected of said bit lines and maintaining unselected bit lines at zero potential such that the floating gate of each said transistor having its drain connected to said selected of said bit lines discharges to a low threshold voltage;

(d) means for applying a read voltage to a selected word line, said read voltage being greater than said low threshold voltage and less than said high threshold voltage, and, simultaneously, maintaining unselected word lines at zero potential, applying a small potential to selected of said bit lines and maintaining unselected bit lines at zero potential such that a said transistor connected to said selected of said bit lines and having a charged floating gate is nonconducting and a said transistor connected to said selected of said bit lines and having a discharged floating gate is conducting; and

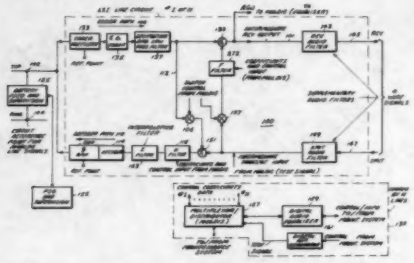
(e) means for monitoring whether a selected of said transistors in said matrix is conducting or nonconducting.

4,377,858

DIGITAL TWO-TO-FOUR WIRE CONVERTER FOR FULL DUPLEX SIGNALS

Robert Treiber, Fairfield, Conn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 23, 1980, Ser. No. 199,905
Int. Cl.³ H04B 1/58
U.S. Cl. 370—24 **17 Claims**



1. A circuit for digitally separating full duplex transmit and receive information signals on a two-wire path to a pair of digital signals, each separate from the other, comprising:

coder means for converting analog transmit and receive signals to a composite digital data stream;

means for deriving coefficient control data representative of the transmission characteristics of said two-wire path;

first digital filter means having said transmit signal coupled thereto, and including a coefficient matrix, said transmit signal being multiplied by said coefficient matrix to adjust the digital output of said first digital filter to derive a signal representative of an undesired signal portion from said transmit signal, said coefficient matrix being derived from said coefficient control data, such that a substantially infinite signal return loss is provided between the separated transmit and receive digital signals;

second digital filter means having said transmit digital signal coupled thereto, and including a variable coefficient matrix controlled by said coefficient control data for providing a synthesized impedance match to said two-wire path;

decoder means for converting said transmit signal to an analog receive signal, including transconductance amplifier means having a substantially infinite output impedance; and

means for combining said output from said first digital filter with said composite digital data stream to cancel the unwanted return transmit signal from said digital data stream, and having an output consisting of said receive signal.

4,377,859

TIME SLOT INTERCHANGER AND CONTROL PROCESSOR APPARATUS FOR USE IN A TELEPHONE SWITCHING NETWORK

Stephen C. Dunning, Cary, and James T. Gwathmey, Raleigh, both of N.C., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

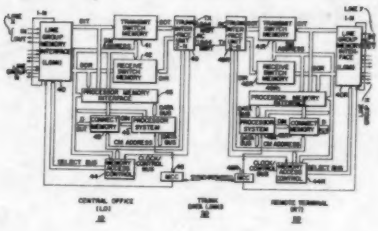
Filed Sep. 2, 1980, Ser. No. 183,512
Int. Cl.³ H04Q 11/04
U.S. Cl. 370—58 **24 Claims**

1. A telephone switching network of the type adapted to provide connections between a plurality of input subscriber line terminals, comprising:

a time slot interchanger means, including a first transmit switch memory (41) having a first plurality of storage locations each associated with a specific address indicative of a given subscriber terminal for storing at said location data to be transmitted by said line, a second receive switch memory (42) having a second plurality of storage locations each associated with a specific address indicative of a given subscriber terminal for storing at said location data to be received by said line,

a connect memory (43) having a plurality of storage locations therein for storing data indicative of connections to be made between subscriber terminals, with each of said locations capable of being accessed by a given address for said location,

subscriber terminal interface means (40) having input terminals coupled to said plurality of subscribers and output terminals coupled to said first and second memories (41 and 42) with certain of said output terminals as coupled to said first memory providing transmitted data, and other terminals coupled to said second memory for receiving data,



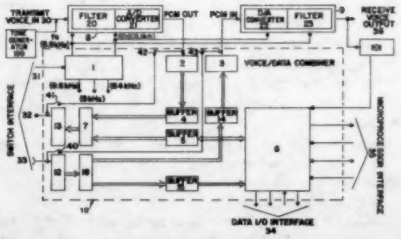
processing means coupled to said subscriber terminal interface means, said first and second memories and said connect memory and adapted to direct all transmitted data emanating from said certain output terminals of said interface means to said first memory locations, and all received data emanating from said second storage locations to said other terminals, said processing means including access control means for controlling said connect memory to couple any of said first and second storage locations associated with any one subscriber terminal to any other of said first and second storage locations associated with another subscriber terminal via said interface means and according to an address stored in said connect memory, whereby any two subscriber terminals are capable of communicating with each other.

4,377,860

BANDWIDTH REDUCTION METHOD AND STRUCTURE FOR COMBINING VOICE AND DATA IN A PCM CHANNEL

Vishwas R. Godbole, San Jose, Calif., assignor to American Microsystems, Inc., Santa Clara, Calif.

Filed Jan. 5, 1981, Ser. No. 222,702
Int. Cl.³ H04J 3/16
U.S. Cl. 370—84 **11 Claims**



1. The method of transmitting a voice signal and data information on a single channel comprising:

(a) sampling the voice signal at a first rate in the absence of data to be transmitted; and

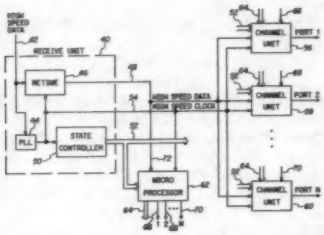
(b) sampling the voice signal at a second rate, lower than said first rate, and sampling the data information at a third rate lower than said first rate, during the presence of data to be transmitted.

4,377,861

TIME DIVISION DEMULTIPLEXER WITH INDEPENDENT DATA DISTRIBUTION

Charles E. Huffman, Plano, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 14, 1980, Ser. No. 206,922
Int. Cl.³ H04J *15/00*
U.S. Cl. 370—112 **5 Claims**



1. Time division demultiplexer apparatus comprising, in combination:

high speed data line means for supplying frames of data bits;

clock recovery means, connected to said data line means, for extracting high speed clock signals from said frames of data bits;

state controller means for providing framing configuration identification signals;

a plurality of channel units, each connected for receiving said frames of data bits, high speed clock signals and said framing configuration identification signals; and

microprocessor means connected to said clock recovery means, said state controller means, and said plurality of channel units for supplying to said channel units framing configuration address signals which dynamically assign clock positions to said channels whereby any channel can pass any data bit in a frame of data bits when the framing configuration address signal matches the framing configuration identification signal.

4,377,862

METHOD OF ERROR CONTROL IN ASYNCHRONOUS COMMUNICATIONS

James S. Koford, Sunnyvale; William C. Jensen, Palo Alto, and Barry B. Woo, Sunnyvale, all of Calif., assignors to The Boeing Company, Seattle, Wash.

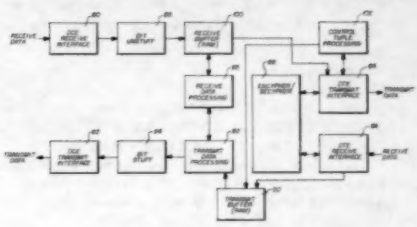
Filed Dec. 6, 1978, Ser. No. 967,001
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—32 **26 Claims**

1. An asynchronous digital data communication system for use with two digital data communication stations, both adapted to operate asychronously with digital characters made up of first control bits and a predetermined number of data bits, comprising:

a first terminal and a second terminal operable with the two stations, respectively, and means operatively associated with said first terminal and said second terminal providing a communication channel therebetween;

said first terminal including station input means operable with one station for asynchronously receiving a first character therefrom and combining only the data bits of said first character with string control bits to form a first information bit string, section means operatively associated with said station input means for dividing said first information bit string into sections, each having a number of bits equal to one or more than said predetermined number, and channel output means operatively associated with said section means for adding section control bits to each section to form a digital word, and then asynchronously transmitting said digital word via said communication channel;

said second terminal including channel input means operatively associated with said communication channel for



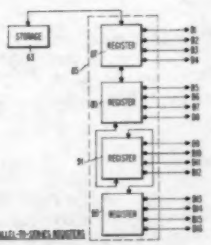
asynchronously receiving said digital word and then removing said section control bits therefrom to form a second information bit string, reformatting means operatively associated with said channel input means for combining only the data bits of said second information bit string with second control bits identical to said first control bits to form a second character identical to said first character, and station output means operatively associated with said reformatting means and operable with the other station for asynchronously presenting said second character to said other station.

4,377,863

SYNCHRONIZATION LOSS TOLERANT CYCLIC ERROR CHECKING METHOD AND APPARATUS

John E. Legory, Paoli; Dana A. Gryger, Downingtown, and Daniel P. Drogichen, West Chester, all of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Sep. 8, 1980, Ser. No. 184,661
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—42 **12 Claims**



1. A method of preventing mistaken corrections due to synchronization loss during storage of an encoded binary data message, said encoded binary data message comprising a message field, a first cyclic type check field for error detection and correction, and a second cyclic type check field for error detection and for detection of mistaken corrections induced by said first cyclic type check field, said method comprising the steps of:

performing data bit sequence reversals of a plurality of certain specific bit locations in said encoded binary data message but not at other bit locations;

writing into storage said encoded binary data message hav-

ing said data bit sequence reversals performed at said plurality of specific bit locations;

reading from storage said encoded binary bit data message having said data bit sequence reversals performed at said plurality of specific bit locations; and

performing reverse data bit sequence reversals of said plurality of certain specific bit locations in said encoded binary data message such that said encoded binary data message is not identical to said encoded binary data message prior to said performance of data bit sequence reversals when synchronization has not been maintained thereby indicating that proper error correction cannot be made.

4,377,864

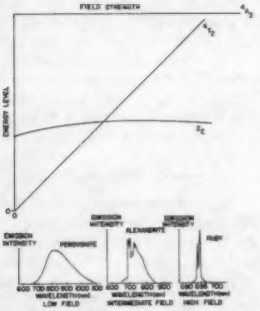
CHROMIUM (III) ORDERED PEROVSKITE LASERS AND MEDIA THEREFOR

Bill C. McCollum, Marlboro; Leonard J. Andrews, and Alexander Lempicki, both of Wayland, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Aug. 10, 1981, Ser. No. 291,664

Int. Cl.³ H01S 3/14

U.S. Cl. 372—41 **15 Claims**



1. A laser medium comprising an ordered perovskite crystal of the general formula:

$$A_2BCr_yB'_{1-y}X_6$$

where A and B are alkali metal ions with an ionic radius of A greater than B; B' is an ion selected from the group consisting of Y^{3+}, La^{3+}, Gd^{3+}, Lu^{3+}, Sc^{3+}, Al^{3+}, Ga^{3+}, and In^{3+}; and X is an ion selected from the group consisting of F^-, Cl^- and Br^-.

4,377,865

SEMICONDUCTOR LASER

Takashi Sugino; Masaru Wada, both of Takatsuki; Hirokazu Shimizu, Toyonaka, and Kunio Itoh, Uji, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 19, 1980, Ser. No. 218,442

Claims priority, application Japan, Dec. 20, 1979, 54-166523; Feb. 19, 1980, 55-20277

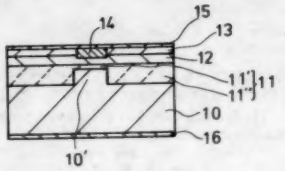
Int. Cl.³ H01S 3/19

U.S. Cl. 372—45 **11 Claims**

1. In a semiconductor laser,

a semiconductor substrate having a stripe-shaped ridge part on a principal face thereof and lower parts on both sides of said ridge part,

an active layer formed directly on said substrate and having a smaller energy gap and a larger refractive index than those of said substrate, said active layer having a thinner part on said ridge part and thicker parts on said lower parts, and



a stripe-shaped electrode formed above said ridge part.

4,377,866

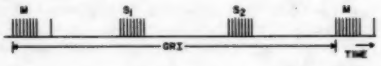
TIME MULTIPLEXED LORAN SIGNAL PROCESSING APPARATUS

Robert V. Janc, Palos Heights; David S. Robins, Buffalo Grove, and Michael H. Retzer, Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 5, 1981, Ser. No. 222,458

Int. Cl.³ G01S 1/24

U.S. Cl. 375—94 **6 Claims**



1. An apparatus for processing radio location signals including a master station pulse group having a plurality of Loran pulses followed in time by a first secondary station pulse group having a plurality of Loran pulses followed in time by a second secondary station pulse group having a plurality of Loran pulses, said apparatus comprising:

input means to which said Loran pulses are provided;

envelope deriver means for generating an envelope derived Loran pulse corresponding to each Loran pulse, thus generating envelope derived Loran pulse groups;

first switching means, operatively coupled to said input means and said envelope deriver means, for selectively switching between the pulses of said Loran pulse groups and the pulses of corresponding envelope derived pulse groups and for providing the pulses so switched to a first output;

sampling means, operatively coupled to said first output, for generating Loran pulse samples and envelope derived Loran pulse samples according to the type of pulse provided to said sampling means by said first switching means;

second switching means, coupled to said sampling means, for selectively switching said Loran samples to a second output and for switching said envelope derived Loran pulse samples to a third output, and

multiplexed control signal generating means, operatively coupled to said first and second switching means, for generating a multiplex control signal which instructs said first and second switching means to switch to said input means and said second output, respectively, during a first period of time per pulse group and to switch to said envelope deriver means and said second output, respectively, for a second period of time per pulse group, said second period of time being substantially greater than said first period of time.

4,377,867

RADIOGRAPHY

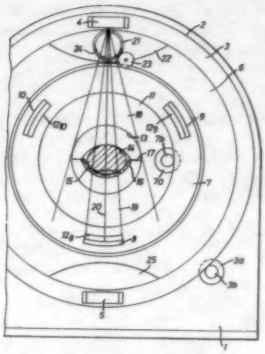
Colin C. Oliver, Slough, England, assignor to EMI Limited, Middlesex, England

Division of Ser. No. 832,378, Sep. 12, 1977. This application Mar. 24, 1981, Ser. No. 247,058

Claims priority, application United Kingdom, Sep. 23, 1976, 39461/76

Int. Cl.³ G03B 41/16

U.S. Cl. 378—19 6 Claims



1. Computerized tomographic apparatus including first support means supporting at least one source of penetrating radiation, first scanning means causing angular movement of said first support means, and with it said source, around a patient position, said source being disposed on said first support means to irradiate the patient position with said penetrating radiation during the angular movement, detector means including a plurality of detector devices sensitive to said radiation for detecting radiation emergent from the patient positions, the irradiation of the patient position and the detection of the radiation being effected in a common plane, the detector means including further detector devices in addition to those receiving said radiation at any one time; second support means, including a ring surrounding said patient position supporting said detector means, with said further detector devices and said first-mentioned detector devices symmetrically distributed around said ring with the detector devices of said detector means being disposed closer to said patient position than is said source, means causing relative movement between the source and the first support means on the one hand and the detector means on the other hand to scan the radiation relative to the patient position and the detector means, and means constraining said further detector devices to allow free passage of said radiation to said first-mentioned detector devices.

4,377,868

TOMOGRAPH FOR THE PRODUCTION OF TRANSVERSE LAYER IMAGES

Franz Mueller, Moehrendorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

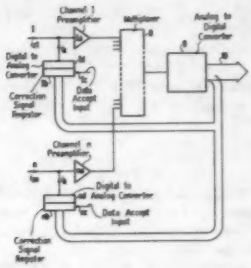
Filed Apr. 1, 1981, Ser. No. 250,060

Claims priority, application Fed. Rep. of Germany, May 22, 1980, 3019606

Int. Cl.³ A61B 6/00; G01T 1/29

U.S. Cl. 378—019 3 Claims

1. Tomographic apparatus for the production of transverse layer images of a radiography subject, comprising a radiation measuring arrangement including a radiation source for generating a radiation beam penetrating the radiography subject, whose cross-sectional extent perpendicular to the layer plane is approximately equal to the layer thickness, and a radiation receiver with an array of measuring channels for converting the radiation intensity behind the subject into corresponding electrical signals, comprising a rotating device for the measuring arrangement, and comprising a measured value converter for the transformation of the signals delivered by the radiation receiver into a layer image, each measuring channel of the radiation receiver including an individual detector of the radiation receiver and an amplifier circuit, and having a measuring channel input connected with the individual detector for receiving a measured value signal to be processed, and a measuring channel output connected with the amplifier circuit for supplying measured value output signals during measurement cycles and being operative to supply further output signals during measurement signal interruptions, each measuring channel (1 through n) of the radiation receiver (2) having correction value generator means (Ib through nb) with an



input connected to the measuring channel output following the amplifier circuit (Ia through na), and having an output connected to the measuring channel input in front of the amplifier circuit (Ia through na), and means comprising said correction value generator means for generating a correction signal which is a function of any deviation of a further output signal at each measuring channel output from a predetermined null output value during a measurement signal interruption, said correction signal generator means being operative for supplying the correction signal so generated to the corresponding measuring channel input during a subsequent measurement cycle for correcting the resulting measured value output signal supplied at the measuring channel output, characterized in that the correction value generator means comprises a register (Ib through nb) with a plurality of memory locations for supplying respective correction values.

4,377,869

PROCEDURE FOR MEASURING COATING RATES

Heikki Venalainen; Rauno Rantanen, both of Imatra, and Rertti Puumalainen, Kuopio, all of Finland, assignors to Enso-Gutzeit Osakeytio, Hesinki, Finland

Division of Ser. No. 95,326, Nov. 19, 1979. This application May 1, 1981, Ser. No. 259,496

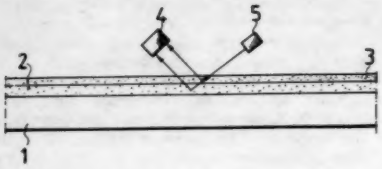
Claims priority, application Finland, Nov. 21, 1978, 783544

Int. Cl.³ G01N 23/22

U.S. Cl. 378—50 3 Claims

1. An improvement in a method of determining the quantities of material in a first coating layer applied to cardboard or equivalent base material as well as in a second coating layer applied to said first coating layer, said method comprising the steps of subjecting said first coating layer to a primary X-ray radiation derived from an outside source and travelled via said second coating layer, so as to excite a characteristic fluorescence radiation in said first coating layer, and measuring the intensity of said fluorescence radiation by means of a detector placed above said second coating layer, whereby the determination is based on the absorption of the primary X-ray radiation and the fluorescence radiation while travelling through said second coating layer, the improvement comprising that, in

addition to exciting the fluorescence radiation of the first coating layer, the primary X-ray radiation is used to excite a characteristic fluorescence radiation in the second coating layer, which is measured by means of a detector and used as the basis for determination of the quantity of material in the second



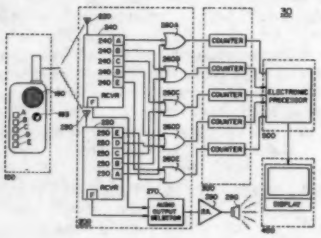
coating layer, while the measurement of the fluorescence radiation of the first coating layer is performed for the determination of the quantity of material in the first coating layer, with the aid of the quantity of material in the second coating layer as determined.

4,377,870

ELECTRONIC AUDIENCE POLLING SYSTEM

Roy E. Anderson, Scotia; Richard L. Frey, Schenectady, and James R. Lewis, Albany, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 21, 1978, Ser. No. 971,703
The portion of the term of this patent subsequent to Sep. 15, 1982, has been disclaimed.
Int. Cl.³ H04B *17/00*; H04J *3/14*
U.S. Cl. 455—2 **28 Claims**



1. An electronic polling system for determining the consensus of an audience to a given stimulus with a plurality of suggested responses, said system comprising:

a plurality of transmitting means, each transmitting means capable of generating a pulse of electromagnetic energy of any one of a common plurality of selected different radio frequencies, each of said selected frequencies corresponding to one of the suggested responses, the number of transmitting means equal to the number of persons to be polled in said audience with each transmitting means generating one of said pulses solely when activated by the associated audience member;

receiving means including an input for receiving said electromagnetic pulses and for providing at each of a plurality of logic outputs, each respectively corresponding to one of said selected radio frequencies, a logic pulse signal each time one of said electromagnetic pulses is received at the selected radio frequency to which said respective output corresponds:

a plurality, equal in number to the number of said plurality of logic outputs, of counting means for totalling the number of said logic pulse signals generated at each of said logic outputs, each counting means being respectively responsive only to an associated different one of said plurality of logic outputs; and

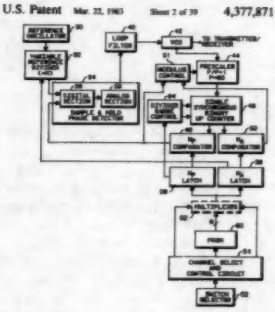
electronic display means responsive to said counting means, for displaying data representative of the total number of pulses counted by each of said counting means such that the number of each of said suggested responses by the audience may be ascertained.

4,377,871

TRANSMIT SECURITY SYSTEM FOR A SYNTHESIZED TRANSCEIVER

Jaime A. Borras, Hialeah, and Ruben J. Gonzalez, Miami, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 6, 1981, Ser. No. 251,657
Int. Cl.³ H04B *1/50*
U.S. Cl. 455—76 **6 Claims**



1. In a digital frequency synthesized portable transceiver capable of transmit and receive modes of operation, including memory means containing information related to the numerical divisors required by the synthesizer to establish the tuning frequency of the transceiver at any of a number of communication channels, a transmit security system for preventing transmission on communication channels predesignated as receive only, comprising:

mode selector means actuating in the alternative transmit and receive modes of operation of the transceiver;

information transfer means accessing said memory means and loading information into the synthesizer to establish a tuning frequency corresponding to a communication channel;

transmit security sensor coupled to said memory means and said mode selector means for determining substantial coincidence of a predetermined pattern of information stored in said memory means with actuation by said mode selector means of the transmit mode for the transceiver; and

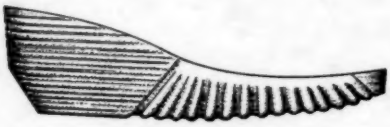
means responsive to said transmit security sensor for disrupting the operation of the information transfer means, thus preventing transmission on the predesignated receive only channel.

DESIGNS

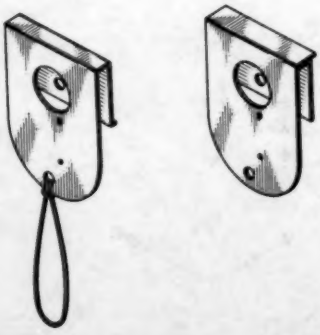
MARCH 22, 1983

268,298
TWO FOOT WARMER
Clarence J. Goguen, 29 Redstone Hill Rd., Sterling, Mass. 01564
Filed Oct. 27, 1980, Ser. No. 201,213
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—264

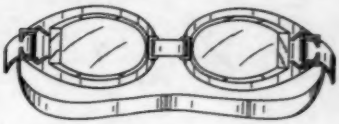
268,299
SHOE SOLE
James P. Argyropoulos, Marino del Ray, Calif., assignor to Cherokee Shoe Company, Inc., Gardena, Calif.
Continuation-in-part of Ser. No. 231,898, May 11, 1981. This application Oct. 9, 1981, Ser. No. 309,994
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—322



268,300
BELT MOUNTED CAMERA SUPPORT CLIP
Lee A. Richards, P.O. Box 752, Malibu, Calif. 90265
Filed Oct. 20, 1980, Ser. No. 198,872
Term of patent 14 years
Int. Cl. D02—*99*
U.S. Cl. D2—400



268,301
GOGGLES
Joseph Haslbeck, West Vancouver, Canada, assignor to Highland Mfg. Company Ltd., Burnaby, Canada
Filed May 27, 1981, Ser. No. 267,976
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—234



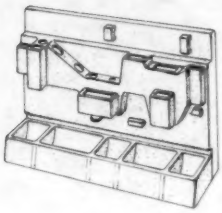
268,302
APRON
Marilyn A. Meade, 230 N. Craig St., Apt. 202, Pittsburgh, Pa. 15213
Filed Feb. 9, 1981, Ser. No. 232,505
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—227

268,303
SHOCK-ABSORBING INNERSOLE
Jeremy D. Gaski, 9972 Sage, Fountain Valley, Calif. 92708
Filed Dec. 22, 1980, Ser. No. 218,714
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—318

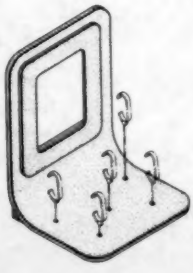
268,304
COMBINED HANDBAG AND CLOCK
Otto K. Schimmel, Scottsdale, Ariz., assignor to Amba Marketing Systems, Inc., Tempe, Ariz.
Filed Nov. 7, 1980, Ser. No. 205,017
Term of patent 14 years
Int. Cl. D03—*01*
U.S. Cl. D3—43

268,305
GARMENT BAG
Ted Stark, Jersey City, N.J., assignor to M & M Luggage Co., Inc., Jersey City, N.J.
Filed Feb. 4, 1981, Ser. No. 231,423
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

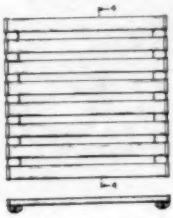
268,306
TOOL ORGANIZER
Humphrey Morton, Rte. 4, Box 450, Danville, Va. 24541
Filed Feb. 9, 1981, Ser. No. 232,664
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—74



268,307
COMBINED WATCH AND JEWELRY DISPLAY STAND
Irving Korn, Williamsville, N.Y., assignor to Bufkor, Inc., Buffalo, N.Y.
Filed Mar. 31, 1980, Ser. No. 136,151
Term of patent 14 years
Int. Cl. D06—*06*
U.S. Cl. D6—85

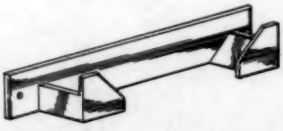


268,308
DRAIN BOARD FOR SHOWER STALLS OR THE LIKE
Giancarlo Milani, Via Monte Grappa 12, Villasanta (Milan), Italy
Filed Apr. 8, 1980, Ser. No. 138,442
Claims priority, application Italy, Oct. 22, 1979, 22925 B/79
[U]
Term of patent 14 years
Int. Cl. D06—*06*
U.S. Cl. D6—86



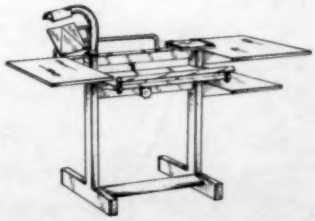
268,309
RACKET HOLDER
B. Kay Wall, 5590 Militia Dr., Stone Mountain, Ga. 30083
Filed Feb. 11, 1981, Ser. No. 233,503
Term of patent 14 years
Int. Cl. D6—*06*; D8—*08*
U.S. Cl. D6—125

268,310
TABLE
Irving M. Rosen, Ardsley on Hudson, N.Y., assignor to The Pace Collection, Inc., New York, N.Y.
Filed Oct. 17, 1979, Ser. No. 85,506
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—146



268,311
STORAGE CHEST
Gerald J. De Persia, 215 Maryland, NE., Grand Rapids, Mich. 49503
Filed Feb. 11, 1980, Ser. No. 120,143
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—150

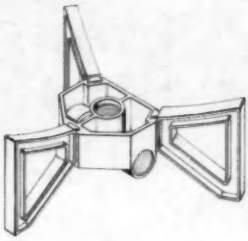
268,312
AUTOMATIC DATA PROCESSING DESK
Kimmo P. K. Römpötti, Vantaa, Finland, assignor to Economic-Kaluste Oy, Helsinki, Finland
Filed Mar. 4, 1980, Ser. No. 127,164
Claims priority, application Finland, Sep. 13, 1979, 558/79
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—179



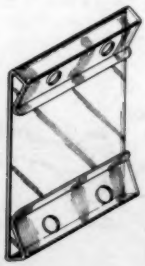
268,313
STORAGE RACK FOR ICE HOCKEY STICKS AND PUCKS OR SIMILAR ARTICLE
Lars-Olof Ryman, Faglabäcksvägen 12, Skillingaryd, Sweden (568 00)
Filed Aug. 21, 1980, Ser. No. 180,095
Claims priority, application Sweden, Feb. 22, 1980, 80000374
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—186

268,314
FLANGED HINGE STRAP FOR FOLDING CASUAL FURNITURE SUCH AS TUBULAR LEG CHAIRS AND THE LIKE
Kyle W. Smith, Clearwater, Fla., assignor to Sun Terrace Casual Furniture, Clearwater, Fla.
Filed Feb. 26, 1981, Ser. No. 238,460
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

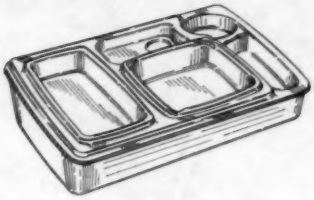
268,315
PLURAL LEG SUPPORT UNIT FOR A WATER TANK OR SIMILAR ARTICLE
Kenneth L. Kirk, Cranston, R.I., assignor to Amtrol Inc., West Warwick, R.I.
Filed Oct. 6, 1980, Ser. No. 194,286
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—196

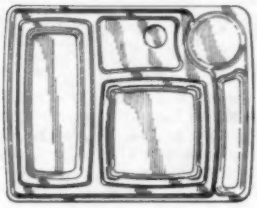


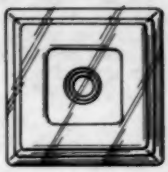
268,316
PICTURE FRAME
Ellis Shamoon, 3618 Gillespie, Suite 109, Dallas, Tex. 75219
Filed Dec. 22, 1980, Ser. No. 218,777
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—242



268,317
TRAY
William B. Wyatt, Jr., Nashville, Tenn., assignor to Aladdin Industries, Chicago, Ill.
Filed Nov. 28, 1980, Ser. No. 211,362
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—38



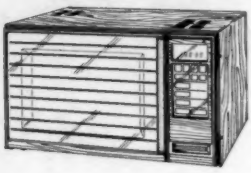




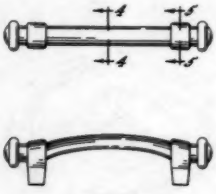
268,318
CANAPE MAKER OR THE LIKE
Robert S. Lutzker, 21 Lee Ave., East Williston, N.Y. 11596
Filed Nov. 24, 1980, Ser. No. 209,468
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—43

268,319
CARAFE
Paul J. Donoski, Madison; Bruce S. Gentilella, New London, and Masao Tsuji, Old Lyme, all of Conn., assignors to North American Philips Corporation, New York, N.Y.
Filed Apr. 25, 1980, Ser. No. 143,576
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—318

268,320
MICROWAVE OVEN
Masamichi Yamamura, Osaka; Toshio Harada, and Michio Tanaka, both of Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Nov. 19, 1980, Ser. No. 208,459
Claims priority, application Japan, May 20, 1980, 55-19949
Term of patent 14 years
Int. Cl. C7—*02*
U.S. Cl. D7—351



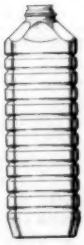
268,321
PULL
Raymond U. H. Tegner, Lodi, Wis., assignor to Amerock Corporation, Rockford, Ill.
Filed Dec. 16, 1980, Ser. No. 217,167
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—317



268,322
DOOR CONTROL SYSTEM
Irving L. Berkowitz, Binghamton, N.Y., assignor to Kason Industries, Inc., Binghamton, N.Y.
Filed Nov. 24, 1980, Ser. No. 209,808
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—330

268,323
HANDLE NUT
Eric K. Schaumloffel, c/o General Chain & Manufacturing Corporation, 3182 Beekman St., Cincinnati, Ohio 45223
Filed Dec. 15, 1980, Ser. No. 216,524
Term of patent 14 years
Int. Cl. D8—*06, 09*
U.S. Cl. D8—397

268,324
BOTTLE
Raoul L. A. Gautier, Belmont sur Vair, France, assignor to Societe Generale des Eaux Minerales de Vittel, France
Filed Dec. 15, 1980, Ser. No. 216,490
Claims priority, application France, Jul. 2, 1980, 92
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—406

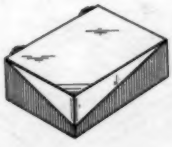


268,325
BOTTLE
Milan Lang, 560 St-Laurent W., Apt. 430, Longueuil, P.Q., Canada (J4H 3X3)
Filed Feb. 6, 1981, Ser. No. 232,285
Claims priority, application Canada, Aug. 7, 1980, 07-08-80-3
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—300

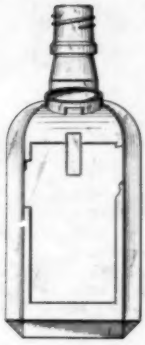
268,326
FLASK OR SIMILAR ARTICLE
Frank H. Witt, Jr., Trumbull, Conn., assignor to Rosalie S. Levine, Trumbell; Mildred J. Bisacca, Fairfield and GRRN Co., Easton, all of, Conn., part interest to each
Filed Oct. 15, 1980, Ser. No. 197,336
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—307

268,327
DISPLAY HOLDER
John L. M. Branagan, Eaglemont, Australia, assignor to Beatrice Publishing Pty. Ltd., St. Heidelberg, Australia
Filed Jan. 2, 1981, Ser. No. 222,174
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—330

268,328
BOX
Robert Lovett, Jr., Woodhill Rd., Newtown, Pa. 18940
Filed Dec. 23, 1977, Ser. No. 864,098
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—347



268,329
BOTTLE
Pierre Cointreau, Seiches sur Loir, France, assignor to Cointreau Holding, Trelaze, France
Filed Dec. 4, 1980, Ser. No. 213,146
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—370



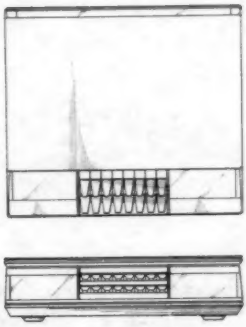
268,330
BOTTLE
Thomas B. Aldrich, III, 42 Balmoral Dr., Spring Valley, N.Y. 10977
Filed Feb. 9, 1981, Ser. No. 232,614
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—370

268,331
COMBINED COSMETIC CONTAINER AND SUPPORT PANEL
Nathan Kay, and Robin M. Kay, both of Encino, Calif., assignors to Max Factor & Co., Hollywood, Calif.
Filed Dec. 30, 1980, Ser. No. 221,459
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—415

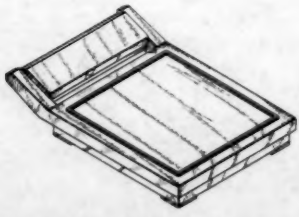
268,332
WRIST WATCH
Raymond Weil, Le Muids, Switzerland, assignor to Raymond Weil S.A., Geneva, Switzerland
Filed Oct. 2, 1980, Ser. No. 193,008
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—32

268,333
THERMOMETER
Yoshio Kojima, Yokohama; Masaharu Katayama, Tokyo, and Haruyuki Kimura, Fujieda, all of Japan, assignors to Toshiba Glass Company, Ltd., Shizuoka, Japan
Filed Nov. 18, 1980, Ser. No. 208,000
Claims priority, application Japan, May 30, 1980, 55-21624
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—57

268,334
ELECTRONIC SCALE
H. C. Harbers, Jr., San Marino, Calif., assignor to Load Cells Inc., South El Monte, Calif.
Filed Oct. 23, 1980, Ser. No. 200,251
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—91

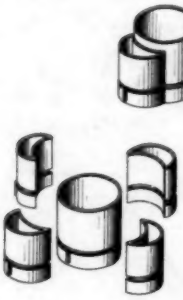


268,335
BATHROOM SCALE
Martin H. Newman, Seekonk, Mass., and Anthony J. Iorio, Providence, R.I., assignors to Creative Tech:Micro Electronics, Inc., Rumford, R.I.
Filed Jul. 15, 1980, Ser. No. 169,476
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—92

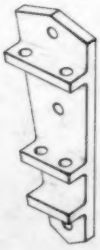


268,336
PENDANT
Jeffrey H. Shapiro, Landing, N.J., assignor to A.B.L. Jewelers, Inc., New York, N.Y.
Filed Jan. 5, 1981, Ser. No. 222,508
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—79

268,337
PLANTER UNIT
Abraham I. Tenzer, and Jes S. Baru, both of Altamonte Springs, Fla., assignors to Dart Industries Inc., Northbrook, Ill.
Filed Apr. 21, 1978, Ser. No. 898,368
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—152

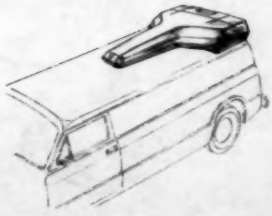


268,338
FLAG HOLDER
Rundlette K. Palmer, P.O. Box 82, Newcastle, Me. 04553
Filed Jan. 29, 1981, Ser. No. 229,775
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—183

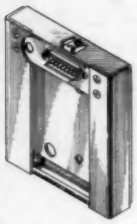


268,339
BICYCLE TIRE
Syoji Inae, and Eiji Fukuchi, both of Kagawa, Japan, assignors to Mitsubishi Belting Ltd., Hyogo, Japan
Filed Feb. 18, 1982, Ser. No. 349,941
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—136

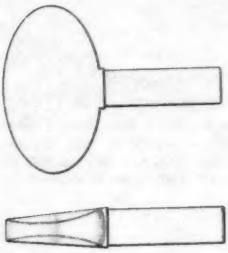
268,340
LUGGAGE CARRIER
Dennis F. Otto, and Vernon R. Wamsley, both of Elkhart, Ind., assignors to Coachmen Industries, Inc., Middlebury, Ind.
Filed Nov. 12, 1980, Ser. No. 206,031
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157



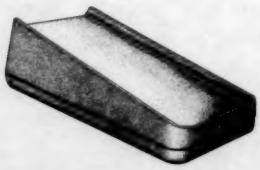
268,341
BATTERY HOLDER
William D. Mallon, Centerville, Va., assignor to Perrott Engineering Labs, Inc., Arlington, Va.
Filed May 27, 1980, Ser. No. 153,545
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—10



268,343
MICROWAVE ANTENNA DIPOLE COVER
Milton Mann, 1333 S. Beverly Glen, Los Angeles, Calif. 90024, and Richard P. Mann, 4273 Clear Valley Dr., Encino, Calif. 91436
Filed Dec. 8, 1980, Ser. No. 214,116
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—90

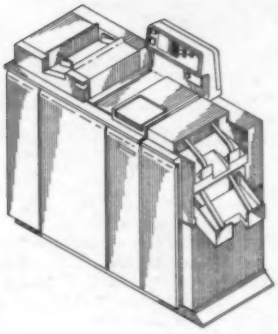


268,342
STAND FOR A PORTABLE TRANSCEIVER OR SIMILAR ARTICLE
Donald M. Genaro, Haworth, N.J.; John N. McGarvey, Drexel Hill, Pa., and Daniel W. Tyler, Middletown, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Dec. 5, 1980, Ser. No. 213,678
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—52

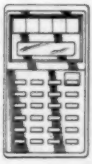


268,344
EDGE CASTING FOR SOIL STABILIZER TINE
Norvel J. Ronck, Wakita, and Halsey J. Wetmore, II, Guymon, both of Okla., assignors to Adams Hard-Facing Company, Inc., Guymon, Okla.
Filed Jun. 11, 1979, Ser. No. 47,283
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—29

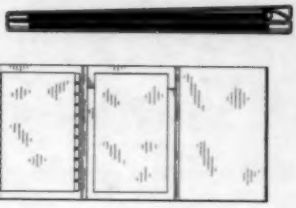
268,345
COPYING MACHINE
Donald A. Robertson, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Oct. 28, 1980, Ser. No. 201,111
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—30



268,346
ELECTRONIC CALCULATOR
Yoshiaki Kobayashi, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Dec. 30, 1980, Ser. No. 221,415
Claims priority, application Japan, Jul. 3, 1980, 26890/1980
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7



268,347
COMBINED ADDRESS AND NOTEBOOK
James L. Marsh, Kansas City, Kans., assignor to Media One, Inc., Kansas City, Kans.
Filed Feb. 23, 1981, Ser. No. 237,252
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—27

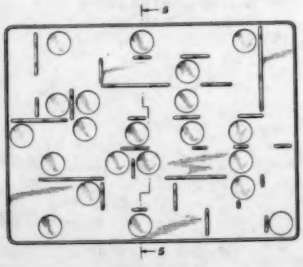


268,348
SUSPENSION BAR FOR HANGING FILES
Vytautas K. Beleckis, East Longmeadow, Mass., assignor to Dennison National Company, Holyoke, Mass.
Filed Feb. 25, 1981, Ser. No. 238,050
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—91

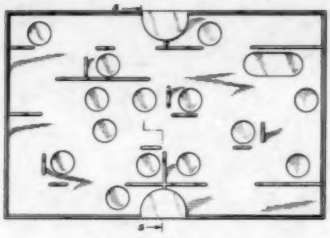
268,349
SIGN
Ronald W. Cobb, Covington, Ga., assignor to Apco Graphics, Inc., Atlanta, Ga.
Filed Mar. 27, 1981, Ser. No. 248,057
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—10

268,350
DIRECTORY SIGN
Ronald W. Cobb, Covington, Ga., assignor to Apco Graphics, Inc., Atlanta, Ga.
Filed May 14, 1981, Ser. No. 264,185
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—10

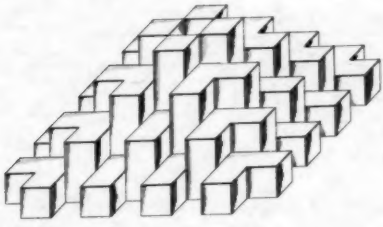
268,351
TABLE-TOP MAZE GAME
Alan M. Steinberg, Rockland County, N.Y., assignor to Gordy International, Inc., New York, N.Y.
Filed Oct. 27, 1980, Ser. No. 201,284
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—17



268,352
HAND-HELD MAZE GAME
Alan M. Steinberg, Rockland County, N.Y., assignor to Gordy International, Inc., New York, N.Y.
Filed Oct. 17, 1980, Ser. No. 201,285
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—17



268,353
THREE-DIMENSIONAL GAME BOARD
Mark Pilipski, 89 Mountainside Ter., Clifton, N.J. 07013
Filed Nov. 13, 1979, Ser. No. 93,277
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—23

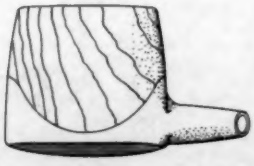


268,354
TOY DOLL
Frank Amico, 145 Suellen Dr., Rochester, N.Y. 14609
Filed Feb. 27, 1981, Ser. No. 238,929
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—171

268,355
WOODEN SOLDIER
Francis E. Nicholson, P.O. Box 344, Murphys, Calif. 95247
Filed Dec. 23, 1980, Ser. No. 219,444
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—178

268,356
GOLF BALL TEE
Robert W. Brisebois, 20919 Island Pkwy. E., Sumner, Wash. 98390
Filed Dec. 29, 1980, Ser. No. 220,310
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—208

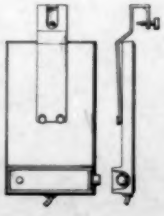
268,357
GOLF DRIVER CLUB HEAD
Robert J. Mader, 1218 Arlington Ave., Torrance, Calif. 90501
Filed Nov. 13, 1980, Ser. No. 206,451
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—214



268,358
HANDLE FOR A SANITARY FITTING OR SIMILAR ARTICLE
Dominic A. Saporito, Fanwood, and Donald M. Genaro, Haworth, both of N.J., assignors to American Standard Inc., New York, N.Y.
Filed Jul. 21, 1980, Ser. No. 170,416
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—28

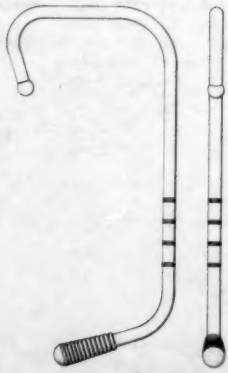
268,359
SHOWER HEAD
Odo Klose, Wuppertal, Fed. Rep. of Germany, assignor to Friedrich Grohe Armaturenfabrik GmbH & Co., Hemer, Fed. Rep. of Germany
Filed Apr. 24, 1981, Ser. No. 257,280
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1980, MR 7109
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35

268,360
AQUARIUM HEATER
Arthur J. Holbrook, Lynnfield, Mass., assignor to Rolf C. Hagen (USA) Corp., Mansfield, Mass.
Filed Nov. 14, 1980, Ser. No. 206,874
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—77

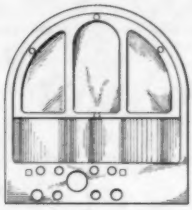


268,361
AIR FRESHENER OR SIMILAR ARTICLE
Fritz von Philipp, Neuburg, and Georg Schimanski, Hagen, both of Fed. Rep. of Germany, assignors to Globol-Werk GmbH, Neuburg, Fed. Rep. of Germany
Filed Mar. 18, 1981, Ser. No. 244,935
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1980, MR 446
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150

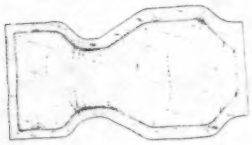
268,362
ACUPRESSURE APPARATUS
Frances Wong, 106 Leighton Rd., 2nd Floor, Flat "F", Hong Kong, Hong Kong
Filed Jul. 10, 1980, Ser. No. 167,310
Term of patent 14 years
Int. Cl. D28—*03;* D24—*04*
U.S. Cl. D24—36



268,363
HYDROTHERAPY SPA
Robert Drake, 341 Kildaire, Bloomingdale, Ill. 60108
Filed Jul. 7, 1980, Ser. No. 166,607
Term of patent 14 years
Int. Cl. D24—*01;* D25—*99;* D23—*02*
U.S. Cl. D24—38



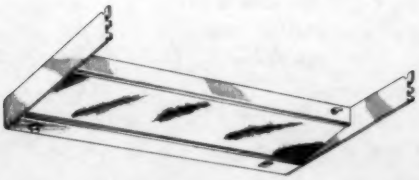
268,364
DIAPER
Christina I. E. Larkö, Hovas, Sweden, assignor to Molnlycke Aktiebolag, Gothenburg, Sweden
Filed Sep. 24, 1980, Ser. No. 190,555
Claims priority, application Sweden, Mar. 28, 1980, 80-0642
Term of patent 14 years
Int. Cl. D2—*01;* D24—*04*
U.S. Cl. D24—50



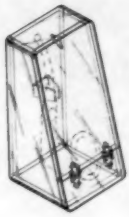
268,365
ORTHOTIC HEEL DEVICE
Howard Malkin, East Brunswick, N.J., assignor to Apex Foot Products Corporation, Englewood, N.J.
Filed Sep. 29, 1980, Ser. No. 191,860
Term of patent 14 years
Int. Cl. D24—*03;* D2—*99*
U.S. Cl. D24—64

268,366
COMBINED ILLUMINABLE NOVELTY PIN AND FLASHING TAIL LIGHT
Paris J. Hasty, 1778 Ponce de Leon Ave., Atlanta, Ga. 30307
Continuation-in-part of Ser. No. 93,822, Nov. 13, 1979, abandoned. This application Dec. 21, 1981, Ser. No. 333,162
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D26—39

268,367
LIGHT MODULE FOR ATTACHMENT TO DESK ORGANIZER
Edmund T. Paquette, Shrewsbury, and Richard M. Latino, Worcester, both of Mass., assignors to Wright Line Inc., Worcester, Mass.
Filed Apr. 17, 1980, Ser. No. 141,169
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—76



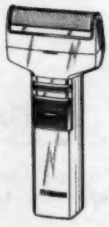
268,368
CRYSTALLINE HOLDER FOR SMOKING PIPE
Henry E. Moss, 1225 Ottawa La., Olivette, Mo. 63132
Filed Nov. 10, 1980, Ser. No. 205,320
Term of patent 14 years
Int. Cl. D6—*06*; D27—*99*
U.S. Cl. D27—06



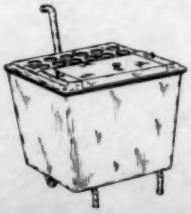
268,369
HAIR DRYER
Roderick McBrien, Poole, England, assignor to F.C.F. Limited, Poole, England
Filed Dec. 16, 1980, Ser. No. 217,101
Claims priority, application United Kingdom, Sep. 4, 1980, 996428
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—13

268,370
HAIR DRYER
Roderick McBrien, Poole, England, assignor to F.C.F. Limited, Poole, England
Filed Dec. 16, 1980, Ser. No. 217,102
Claims priority, application United Kingdom, Sep. 4, 1980, 996428
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—13

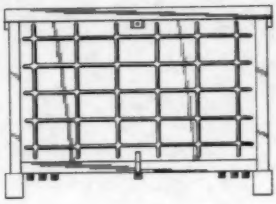
268,371
ELECTRIC SHAVER
Yonosuke Iwai, and Takeshi Takagi, both of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan
Filed Dec. 24, 1980, Ser. No. 219,721
Claims priority, application Japan, Jun. 24, 1980, 55-25336
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—49



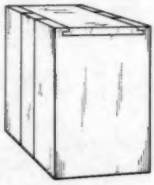
268,372
SPORTS EQUIPMENT CART
James C. Knott, 1838 Dominion Dr., Fort Wayne, Ind. 46815
Filed Jan. 26, 1981, Ser. No. 228,385
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D34—25



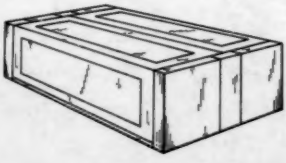
268,373
CITRUS BOX
Alexander G. Jonson, Loveland, Ohio, assignor to Nestier Corporation, Cincinnati, Ohio
Filed Sep. 25, 1980, Ser. No. 190,558
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D34—40



268,374
CREMAIN VAULT
Gerald A. Dercks, and Michael J. Dercks, both of 4228 Park Ave. S., Minneapolis, Minn. 55407
Filed Dec. 12, 1980, Ser. No. 216,024
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D99—5



268,375
CREMAIN VAULT
Gerald A. Dercks, and Michael J. Dercks, both of 4228 Park Ave. S., Minneapolis, Minn. 55407
Filed Dec. 12, 1980, Ser. No. 216,026
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D99—5



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TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF MARCH, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Inc.: *See*—
Chen, Ying-Ho, 4,377,582, Cl. 424-251.000.

A la Telediffusion Centre National: *See*—
Noirel, Yves M.; Blineau, Joseph; Leray, Pierre; and Baudoin, Jean-Pierre, 4,377,822, Cl. 358-139.000.

A. Nattermann & Cie GmbH: *See*—
Lautenschlager, Hans-Heiner; Betzing, Hans; Stoll, Brigitte; and Probst, Manfred, 4,377,695, Cl. 548-305.000.

A/S Niro Atomizer: *See*—
Buschmann, John C.; Rasmussen, Elizabeth L.; Webster, William C.; and Veltman, Preston L., 4,377,414, Cl. 106-85.000.

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Abcor, Inc.: *See*—
Jakabhazy, Stephen Z., 4,377,481, Cl. 210-500.200.

Abe, Haruhiko: *See*—
Mashiko, Yoji; Takano, Hirozo; Abe, Haruhiko; Asai, Sotoju; Mizuguchi, Kazuo; and Nomoto, Sumio, 4,377,734, Cl. 219-121.0PE.

Abel, William A.: *See*—
Massey, Lester G.; Brabets, Robert I.; and Abel, William A., 4,377,392, Cl. 44-51.000.

Abex Corporation: *See*—
Khandros, Igor Y., 4,377,196, Cl. 164-66.100.

Abrahamovich, Karen M.; Hamel, Clifford J.; Payne, Edward H.; and Weed, Dean R., to International Business Machines Corporation. Methods of simultaneous contact and metal lithography patterning. 4,377,633, Cl. 430-312.000.

Abthoff, Jorg; Schuster, Hans-Dieter; Langer, Hans-Joachim; and Laszlo, Marijan, to Daimler-Benz Aktiengesellschaft. Additive means for an air compressing internal combustion engine. 4,377,135, Cl. 123-25.00J.

Achia, Biddanda U., to Exxon Research and Engineering Co. Solvent dewaxing waxy hydrocarbon oils using dewaxing aid. 4,377,467, Cl. 208-33.000.

Achorn, Frank P.; and McGill, Kenneth E., to Tennessee Valley Authority. Ammonium polyphosphate sulfate fertilizers from wet-process phosphoric acid. 4,377,406, Cl. 71-36.000.

Ackermann, Peter; Gsell, Laurenz; and Wehrli, Rudolf, to Ciba-Geigy Corporation. 3-Phenoxybenzyl compounds. 4,377,532, Cl. 260-465.00E.

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Adachi, Ryuzi: *See*—
Nomura, Mitsuo; Amano, Shigeru; Okubo, Sho; Hosaka, Takuo; Shiraishi, Kunihiko; and Adachi, Ryuzi, 4,377,413, Cl. 106-76.000.

Adair, John E.: *See*—
Daunt, John E.; Tipton, John P.; and Adair, John E., 4,377,736, Cl. 219-121.0LH.

Adams, William E., to Consumers Power Company. Incore cutting machine. 4,377,551, Cl. 376-260.000.

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Glotzbach, Helmut, 4,377,129, Cl. 118-412.000.

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Airco, Inc.: *See*—
Rothchild, Ronald D., 4,377,173, Cl. 131-291.000.

Aisan Industry Co., Ltd.: *See*—
Oniki, Tetsuya; and Kadowaki, Kunio, 4,377,146, Cl. 123-520.000.
Wada, Satomi, 4,377,538, Cl. 261-44.00C.

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Kobayashi, Hideyuki, 4,377,069, Cl. 60-547.100.
Murakami, Nobora; Hasegawa, Hiromi; and Iwase, Yoshinobu, 4,377,095, Cl. 74-759.000.
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Ajinomoto Co., Inc.: *See*—
Ajisaka, Katsumi; and Iwashita, Yuji, 4,377,512, Cl. 260-112.00B.

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Akagi, Motoo: *See*—
Morishita, Hajime; Kohashi, Takahiro; Nonogaki, Saburo; Akagi, Motoo; Hayashi, Nobuaki; and Uchino, Shoichi, 4,377,630, Cl. 430-176.000.

Akahama, Motoharu: *See*—
Ikei, Akira; Akahama, Motoharu; Wada, Tokisuke; and Onogi, Takashi, 4,377,617, Cl. 428-214.000.

Akase, Sigeyuki: *See*—
Kohyama, Fuzimasa; Inoue, Yasusuke; and Akase, Sigeyuki, 4,377,302, Cl. 285-334.000.

Akashi, Shunji, to Yoshida Kogyo K.K. Separable slide fastener. 4,377,022, Cl. 24-205.11R.

Akimura, Yoshitaka: *See*—
Mifune, Hiroyuki; Takada, Shunji; Akimura, Yoshitaka; and Fuseya, Yoshiharu, 4,377,634, Cl. 430-440.000.

Aktiebolaget Bahco Ventilation: *See*—
Kruse, Rolf A. S.; Gustavsson, Karl A. L.; and Jansson, Karl A., 4,377,201, Cl. 165-76.000.

Aktiebolaget Bofors: *See*—
Gustavsson, Olle; and Sundmar, Goran, 4,377,104, Cl. 89-45.000.

Albertini, Francis G., to United States of America, Air Force. Sealing assembly. 4,377,291, Cl. 277-105.000.

Albery, Wyndham J., to National Research Development Corporation. Carbon dioxide measurement. 4,377,446, Cl. 204-1.00T.

Alchermes, Stephen L. Athletic shoe sole. 4,377,041, Cl. 36-30.00R.

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Johansson, Karl B. V., 4,377,204, Cl. 165-166.000.

Alfter, Franz-Werner; and Breitscheidel, Hans-Ulrich, to Dynamit Nobel Aktiengesellschaft. Floor mat, especially for motor vehicles. 4,377,614, Cl. 428-213.000.

Allemand, Charly D.: *See*—
Green, Gary P.; Allemand, Charly D.; Brewer, David L.; Iida, Hitoshi; and Maldari, Mario A., 4,377,340, Cl. 356-237.000.

Allen, Herbert, to Hallen Company. Cork extractor. 4,377,096, Cl. 81-3.38A.

Allen, Howard L., to W. R. Grace & Co. Phosphate flotation. 4,377,472, Cl. 209-166.000.

Allied Corporation: *See*—
Anello, Louis G.; and Sweeney, Richard F., 4,377,716, Cl. 570-153.000.
Anello, Louis G.; and Sweeney, Richard F., 4,377,717, Cl. 570-172.000.
Nychka, Henry R.; Hino, John B.; Eibeck, Richard E.; and Robinson, Martin A., 4,377,715, Cl. 570-123.000.

Alpermann, Hans G.: *See*—
Stache, Ulrich; Fritsch, Werner; Alpermann, Hans G.; and Sandow, Jurgen K., 4,377,575, Cl. 424-243.000.

Alps Electric Co., Ltd.: *See*—
Takagi, Susumu; and Suzuki, Nobuhiko, 4,377,048, Cl. 40-367.000.

Alscher, Arnold: *See*—
Giebeler, Eberhard; Bluhm, Bernhard; Alscher, Arnold; Moraw, Klaus; Collin, Gerd; and Nilles, Heinzpeter, 4,377,040, Cl. 34-16.500.

Aluminium de Grece: *See*—
Casdas, Spyridon, 4,377,452, Cl. 204-67.000.

AM International, Inc.: *See*—
Seelenbinder, Terry G.; Jackson, Richard W.; and Kajohn, Thomas D., Jr., 4,377,331, Cl. 354-300.000.

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Nomura, Mitsuo; Amano, Shigeru; Okubo, Sho; Hosaka, Takuo; Shiraishi, Kunihiko; and Adachi, Ryuzi, 4,377,413, Cl. 106-76.000.

American Colloid Co.: *See*—
Maul, Peter L.; and Robertson, Albert E., 4,377,416, Cl. 106-98.000.

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Grasso, Charles P., 4,377,531, Cl. 260-465.00F.
Tomcufcik, Andrew S.; Wright, William B., Jr.; and Marsico, Joseph W., Jr., 4,377,589, Cl. 424-270.000.
Trenbeath, Steven L.; Feldman, Allan M.; and Nummy, Laurence J., 4,377,530, Cl. 260-453.00P.

American Hardware & Paint Co., Inc.: *See*—
Josephson, Louis, 4,377,350, Cl. 403-161.000.

American Microsystems, Inc.: *See*—
Godbole, Vishwas R., 4,377,860, Cl. 370-84.000.

AMP Incorporated: *See*—
Lathrop, John C.; and Laudig, Ronald C., 4,377,320, Cl. 339-177.00R.
MacDougall, Alan R., 4,377,319, Cl. 339-75.00M.
Weisenburger, Lawrence P., 4,377,321, Cl. 339-220.00R.

Anan, Kuniyoshi: *See*—
Minawa, Junzi; Wakuri, Shinjiro; and Anan, Kuniyoshi, 4,377,277, Cl. 266-80.000.

Anderson, Roy E.; Frey, Richard L.; and Lewis, James R., to General Electric Company. Electronic audience polling system. 4,377,870, Cl. 455-2.000.

Ando, Shizuo: *See*—
Kamimura, Teturo; Komatsubara, Masahiro; Ando, Shizuo; and Inanaga, Takuzi, 4,377,829, Cl. 360-96.500.

Andrews, Leonard J.: *See*—
McCollum, Bill C.; Andrews, Leonard J.; and Lempicki, Alexander, 4,377,864, Cl. 372-41.000.

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Anthony, Thomas R., to General Electric Company. Liquid metal inclusion migration by means of an electrical potential gradient. 4,377,423, Cl. 148-171.000.

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Parker, Alan J.; Singh, Pritam; and Avraamides, James, 4,377,623, Cl. 429-15.000.

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Amano, Matsuo; Sugawara, Toru; Mouri, Yasunori; Aochi, Yoshikazu; and Sakamoto, Shinichi, 4,377,137, Cl. 123-179.00B.

Aoki, Takashi: *See*—
Nishikawa, Masao; Aoki, Takashi; and Sato, Yoichi, 4,377,217, Cl. 180-143.000.

Areaux, Larry D.; and Dudley, Russell D., to Reclamet, Inc. Chip and turnings separator and crusher. 4,377,259, Cl. 241-73.000.

Arends, Albert W.; Pickard, George L.; West, George A.; and Russell, Edward J., to Leesona Corporation. Differential pressure forming machine with variable mold closed cycle. 4,377,377, Cl. 425-155.000.

Arion, Vitaly Y.: *See*—
Lopukhin, Jury M.; Petrov, Rem V.; Arion, Vitaly Y.; Breusov, Jury N.; Gladysheva, Tatyana V.; Sanina, Irina V.; Lebedev, Vasily V.; Kirzon, Serafima S.; and Ivanushkin, Evgeny F., 4,377,511, Cl. 260-112.00R.

Arizona Chemical Company: *See*—
Ruckel, Erwin R.; and Epstein, Martin, 4,377,510, Cl. 260-97.000.

Armstrong, Wayne T.: *See*—
Smith, Bernard T.; Armstrong, Wayne T.; and Nelson, Richard D., 4,377,747, Cl. 250-370.000.

Arnold, Fred E.: *See*—
Helminiak, Thaddeus E.; Benner, Charles L.; Arnold, Fred E.; and Husman, George, 4,377,546, Cl. 264-232.000.

Arquette, Suze E.: *See*—
Guthrie, James L.; and Arquette, Suze E., 4,377,645, Cl. 521-137.000.

Arth, Glen E., deceased: *See*—
Rasmusson, Gary H.; Johnston, David B. R.; and Arth, Glen E., deceased, 4,377,584, Cl. 424-258.000.

Arth, Rose B., executrix: *See*—
Rasmusson, Gary H.; Johnston, David B. R.; and Arth, Glen E., deceased, 4,377,584, Cl. 424-258.000.

Arthur D. Little, Inc.: *See*—
Santhanam, Chakra J., 4,377,356, Cl. 406-109.000.

Asagi, Osamu; and Sakai, Masaaki, to Sony Corporation. Switching drive circuit. 4,377,777, Cl. 318-68.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Ohmura, Kaoru; Shibasaki, Ichiro; and Kimura, Takeo, 4,377,652, Cl. 524-104.000.
Sakurai, Hisaya; Hamada, Minoru; and Matsuzaki, Kazuhiko, 4,377,667, Cl. 525-400.000.
Shiraki, Toshinori; Yamori, Akio; and Morita, Hideo, 4,377,665, Cl. 525-250.000.

Asai, Sotoju: *See*—
Mashiko, Yoji; Takano, Hirozo; Abe, Haruhiko; Asai, Sotoju; Mizuguchi, Kazuo; and Nomoto, Sumio, 4,377,734, Cl. 219-121.0PE.

ASEA Aktiebolag: *See*—
Asplund, Gunnar; Eklund, Lars; and Ostlund, Bernt, 4,377,835, Cl. 361-91.000.
Bjorklund, Hans, 4,377,780, Cl. 322-29.000.
Eriksson, Leif; and Liberman, Salomon, 4,377,834, Cl. 361-82.000.

Ashcraft, Charles R.; and Park, Hee C., to Mobil Oil Corporation. Lustrous satin appearing, opaque film compositions and method of preparing same. 4,377,616, Cl. 428-213.000.

Ashida, Shin: *See*—
Sugimoto, Kaname; and Hayashibara, Yasushi, 4,377,513, Cl. 26-112.00R.

Ashland Oil, Inc.: *See*—
Hettinger, William P., Jr.; Carruthers, James D.; and Watkins, William D., 4,377,470, Cl. 208-120.000.

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Athe, Christian: *See*—
Genini, Maurice; Athe, Christian; and Aubert, Jean-Paul, 4,377,186, Cl. 138-111.000.

Atlantic Richfield Company: *See*—
Bourland, Larry G., 4,377,664, Cl. 525-94.000.
Laros, Timothy J.; and Pick, Richard D., 4,377,473, Cl. 209-167.000.

Atlas Copco Aktiebolag: *See*—
Johansson, Folke L.; and Svenning, Bengt F. S., 4,377,183, Cl. 137-606.000.

Aubert, Jean-Paul: *See*—
Genini, Maurice; Athe, Christian; and Aubert, Jean-Paul, 4,377,186, Cl. 138-111.000.

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Auto-Line Manufacturing Corp.: *See*—
Shekel, Joseph; and DeStefano, Joseph, 4,377,317, Cl. 339-29.00B.

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Parker, Alan J.; Singh, Pritam; and Avraamides, James, 4,377,623, Cl. 429-15.000.

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Parker, Richard G., 4,377,459, Cl. 204-159.180.

Bachelard, Roland; and Barral, Robert, to Produits Chimiques Ugine Kuhlmann. Novel process for the preparation of high purity alumina from ammonium alum. 4,377,566, Cl. 423-631.000.

Baer, John R.: *See*—
Mangels, John A.; and Baer, John R., 4,377,542, Cl. 264-65.000.

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Fischer, William F.; and Bailey, Charles A., II, 4,377,611, Cl. 428-192.000.

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Friedman, Ernest H.; Flammer, Charles N.; Baker, Daniel A.; and Vamvakas, Spiro, 4,377,158, Cl. 128-1.00R.

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Schulz, Martin, Jr.; and Bane, James E., 4,377,279, Cl. 267-103.000.

Banks, Bruce A. Ion beam sputter-etched ventricular catheter for hydrocephalus shunt. 4,377,169, Cl. 604-8.000.

Bardenhagen, Dietrich; Hausler, Nikolaus; Niemann, Helmut; Greve, Heinz; and Schluer, Karl-Heinz, to Hauni-Werke Korber & Co. KG. Apparatus for simultaneous severing of plural moving parallel rods. 4,377,098, Cl. 83-310.000.

Barmann, Hans, to Mannesmann Aktiengesellschaft. Apparatus for equalizing pressure in shaft furnaces. 4,377,278, Cl. 266-197.000.

Barnes, John E.; Goebel, Franz; and McHugh, William T., to GTE Products Corporation. Integrated carbon/insulator structure and method for fabricating same. 4,377,033, Cl. 29-623.500.

Barral, Robert: *See*—
Bachelard, Roland; and Barral, Robert, 4,377,566, Cl. 423-631.000.

Barrick, Paul E.; and Zarur, George L., to WRC Processing Company. Organic sludge dewatering process. 4,377,486, Cl. 210-712.000.

Barriere, Jean-Claude: *See*—
Gero, Stephan; Cleophax, Jeanine; Barriere, Jean-Claude; and Cier, Andre, 4,377,704, Cl. 549-39.000.

Barry, John E.; Finkelstein, Manuel; and Ross, Sidney D., to Sprague Electric Company. Anomalous salts of dibasic acids. 4,377,692, Cl. 546-186.000.

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BASF Aktiengesellschaft: *See*—
Graf, Fritz, 4,377,696, Cl. 548-335.000.
Hahn, Erwin; Lach, Dietrich; Schneider, Kurt; Strickler, Rainer; and Streicher, Rolf, 4,377,387, Cl. 8-94.170.

Bathe, John G., Jr.: *See*—
Irish, David C.; and Bathe, John G., Jr., 4,377,539, Cl. 261-121.00B.

Bauduin, Jean-Pierre: *See*—
Noirel, Yves M.; Blineau, Joseph; Leray, Pierre; and Bauduin, Jean-Pierre, 4,377,822, Cl. 358-139.000.

Bauer, Gordon L.: *See*—
Kovaleski, Joseph J.; and Bauer, Gordon L., 4,377,264, Cl. 242-25.00R.

Bauer, Peter. Footwear having removable sole. 4,377,042, Cl. 36-101.000.

Baugh, John E. Stove pipe cleaning apparatus. 4,377,015, Cl. 15-162.000.

Bayer Aktiengesellschaft: *See*—
Block, Hans-Dieter; and Frohlen, Hans-Gunther, 4,377,537, Cl. 260-969.000.
Giesecke, Henning; Merten, Rudolf; and Rottmaier, Ludwig, 4,377,694, Cl. 548-264.000.
Harms, Wolfgang; Wunderlich, Klaus; and von Oertzen, Klaus, 4,377,688, Cl. 544-189.000.
Kaiser, Reinhard; Behre, Horst; Dammann, Jurgen; Putter, Rolf; and Vogel, Axel, 4,377,535, Cl. 260-505.00C.
Kopp, Richard; Grogler, Gerhard; and Mann, Max, 4,377,644, Cl. 521-94.000.
Krimm, Heinrich; Buysch, Hans-Josef; and Botta, Artur, 4,377,670, Cl. 525-467.000.
Schundehutte, Karl H.; Reel, Henning; and Kruckenberg, Winfried, 4,377,390, Cl. 8-671.000.

vor der Bruck, Dieter; and Kabbe, Hans-Joachim, 4,377,518, Cl. 260-156.000.
Wassen, Jurgen; and Konigshofen, Heinrich, 4,377,700, Cl. 548-475.000.
Bayless, Robert G.: *See*—
Hart, Ronald L.; Work, Dale E.; Davis, Daniel; and Bayless, Robert G., 4,377,621, Cl. 428-425.800.
BBC Brown, Boveri & Company Limited: *See*—
Benz, Hans, 4,377,032, Cl. 29-599.000.
Sittig, Roland, 4,377,816, Cl. 357-13.000.
Beach, David L.; and Harrison, James J., to Gulf Research & Development Company. Group VA salts and process for preparing same. 4,377,528, Cl. 260-440.000.
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Beaver, Jack L.; Schroeder, Jerry P.; and Whitney, John M., to Honeywell Inc. Thermostatic apparatus. 4,377,346, Cl. 374-1.000.
Beck, Christian A., to Pitney Bowes Inc. Document scanning apparatus for an electrostatic copier. 4,377,337, Cl. 355-8.000.
Beckley, Don A.: *See*—
Street, Sidney W.; and Beckley, Don A., 4,377,657, Cl. 524-424.000.
Beckman Instruments, Inc.: *See*—
Huffman, Eric C.; and Woodall, James F., 4,377,254, Cl. 494-12.000.
Becton, Dickinson and Company: *See*—
Johnson, Raymond, 4,377,554, Cl. 422-239.000.
Bednarz, Joseph F. Method for graining metal lithographic plate. 4,377,447, Cl. 204-15.000.
Beeley, Micheal G.: *See*—
Thompson, James A.; and Beeley, Micheal G., 4,377,094, Cl. 74-710.500.
Behre, Horst: *See*—
Kaiser, Reinhard; Behre, Horst; Dammann, Jurgen; Putter, Rolf; and Vogel, Axel, 4,377,535, Cl. 260-505.00C.
Beihammer, Horst: *See*—
Wienand, Josef; and Beihammer, Horst, 4,377,280, Cl. 267-180.000.
Belew, Robert R.; and Boehme, Richard J., to United States of America, National Aeronautics and Space Administration. Electrical rotary joint apparatus for large space structures. 4,377,266, Cl. 244-159.000.
Bell Telephone Laboratories, Incorporated: *See*—
Donnelly, Vincent M.; and Flamm, Daniel L., 4,377,436, Cl. 156-626.000.
Grau, Thomas G., 4,377,315, Cl. 339-17.00R.
Jin, Sungho; and Tiefel, Thomas H., 4,377,797, Cl. 335-153.000.
Kohl, Paul A., 4,377,448, Cl. 204-46.00G.
Kohl, Paul A., 4,377,449, Cl. 204-46.00R.
Okinaka, Yutaka, 4,377,450, Cl. 204-46.00R.
Sautter, Helmuth O.; and Swicker, Donald B., 4,377,821, Cl. 358-133.000.
Schonhorn, Harold; and Sharpe, Louis H., 4,377,619, Cl. 428-333.000.
Taylor, Gary N.; and Venkatesan, Thirumalai N. C., 4,377,437, Cl. 156-628.000.
Bellus, Daniel: *See*—
Zweifel, Hans; and Bellus, Daniel, 4,377,668, Cl. 525-426.000.
Zweifel, Hans; and Bellus, Daniel, 4,377,669, Cl. 525-445.000.
Bendix Autolite Corporation: *See*—
Weber, David C.; Bilger, Alan H.; and Woodruff, Philip R., 4,377,801, Cl. 338-34.000.
Bendix Corporation, The: *See*—
Fecher, Douglas A., 4,377,105, Cl. 91-391.00R.
Staron, John C., 4,377,292, Cl. 279-46.00R.
Taig, Alistair G., 4,377,549, Cl. 264-320.000.
Benner, Charles L.: *See*—
Helminiak, Thaddeus E.; Benner, Charles L.; Arnold, Fred E.; and Husman, George, 4,377,546, Cl. 264-232.000.
Bennett, Charles E., to Motorola Inc. Heat energized vapor adsorbent pump. 4,377,398, Cl. 55-208.000.
Benoit-Gonin, Roger; Berger, Jean-Luc; Fontanes, Sylvain; and Picquendar, Jean-Edgar, to Thompson-CSF. Device for reading a quantity of electric charge. 4,377,760, Cl. 307-530.000.
Benz, Hans, to BBC Brown, Boveri & Company Limited. Superconducting cable. 4,377,032, Cl. 29-599.000.
Berg, Bernard J., to Foresight Enterprises, Incorporated. Method of controlling the temperature of an electrically heated element. 4,377,738, Cl. 219-490.000.
Bergamaschi, Mario: *See*—
Schmidt, Gunther; and Bergamaschi, Mario, 4,377,576, Cl. 424-244.000.
Berger, Jean-Luc: *See*—
Benoit-Gonin, Roger; Berger, Jean-Luc; Fontanes, Sylvain; and Picquendar, Jean-Edgar, 4,377,760, Cl. 307-530.000.
Bergmann, Horst; Pracht, Hans; and Holloh, Klaus-Dieter, to Daimler-Benz Aktiengesellschaft. Internal combustion engine. 4,377,147, Cl. 123-527.000.
Bernard, Armand R.: *See*—
Bartoli, Michel; Bernard, Armand R.; and Noirot, Daniel, 4,377,609, Cl. 428-71.000.
Bernhardt & Frederick Co., Inc.: *See*—
Giebeler, Bernhardt F., 4,377,179, Cl. 137-494.000.
Berry, Clyde F. Electrically heated steam boiler for generating superheated steam. 4,377,737, Cl. 219-275.000.
Bertolazzi, Luciano F., to Chicago Bridge & Iron Company. Apparatus for inside coating double curved shell. 4,377,128, Cl. 118-317.000.
Bertus, Brent J.; and McKay, Dwight L., to Phillips Petroleum Company. Cracking catalysts passivated by barium. 4,377,494, Cl. 252-411.00R.
Bertus, Brent J.: *See*—
Roberts, John S.; McKay, Dwight L.; and Bertus, Brent J., 4,377,504, Cl. 252-455.00Z.
Beson, John. Gate valve having a secondary seal. 4,377,273, Cl. 251-210.000.
Betzing, Hans: *See*—
Lautenschlager, Hans-Heiner; Betzing, Hans; Stoll, Brigitte; and Probst, Manfred, 4,377,695, Cl. 548-305.000.
Beveridge, Andrew J.: *See*—
Rolls, George H.; Beveridge, Andrew J.; Challener, Ronald T.; and Stuart, William, 4,377,478, Cl. 210-242.300.
Bewick, Alan; Mellor, John M.; and Pons, Bobby S., to National Research Development Corporation. Electrochemical synthesis and product. 4,377,453, Cl. 204-78.000.
Bexley, Robert G.; and Thomson, Barry South. Process of making book covers. 4,377,430, Cl. 156-184.000.
Bigham, Eric C., to Pfizer Inc. Bis-esters of methanediol with penicillins and penicillanic acid 1,1-dioxide. 4,377,524, Cl. 260-245.20R.
Bilger, Alan H.: *See*—
Weber, David C.; Bilger, Alan H.; and Woodruff, Philip R., 4,377,801, Cl. 338-34.000.
Biljes, William H., to Component Manufacturing & Design, Inc. Non-return valve for plastic injection molding. 4,377,180, Cl. 137-528.000.
Bill, Robert C.: *See*—
Wisander, Donald W.; and Bill, Robert C., 4,377,371, Cl. 415-174.000.
Bindra, Jasjit S.: *See*—
Hess, Hans-Jurgen E.; Bindra, Jasjit S.; and Shah, Praful K., 4,377,581, Cl. 424-251.000.
Biotech Research Laboratories, Inc.: *See*—
Granlund, David J., 4,377,077, Cl. 62-457.000.
Birchall, James D.; and Carey, John G., to Imperial Chemical Industries Limited. Particulate filler, coated with material bonded thereto and containing a sulfur-containing group which releases sulfur as a curing agent for s-curable unsaturated polymers. 4,377,418, Cl. 106-306.000.
Bishop, Clifford F.: *See*—
Schultz, John T.; and Bishop, Clifford F., 4,377,795, Cl. 335-23.000.
Bittner, Friedrich: *See*—
Hentschel, Klaus; Bittner, Friedrich; Schreyer, Gerd; and Franz, Georg, 4,377,344, Cl. 366-173.000.
Bjorklund, Hans, to ASEA Aktiebolag. Means for damping mechanical torsional oscillations of an electric a.c. generator. 4,377,780, Cl. 322-29.000.
Blackmer, David E.; and Welland, David R., to DBX, Inc. Compander system. 4,377,792, Cl. 333-14.000.
Blineau, Joseph: *See*—
Noirel, Yves M.; Blineau, Joseph; Leray, Pierre; and Bauduin, Jean-Pierre, 4,377,822, Cl. 358-139.000.
Block, Alvin, to Intimate Jewels, Inc. Chain and end attachment means. 4,377,078, Cl. 63-2.000.
Block, Hans-Dieter; and Frohlen, Hans-Gunther, to Bayer Aktiengesellschaft. Preparation of alkane phosphonic and phosphinic acid aryl esters. 4,377,537, Cl. 260-969.000.
Blomgren, Oscar C., Jr.; and Renken, Henry A., to Inter-Probe, Inc. Energy transfer apparatus. 4,377,839, Cl. 361-233.000.
Blount, David H. Process for the production of foamed poly(epoxy-polyisocyanate)silicate polymers. 4,377,646, Cl. 521-154.000.
Blount, David H. Process for the production of polyester silicate resinous products. 4,377,659, Cl. 524-457.000.
Blount, David H. Process for the production of polyhydroxy lignin-cellulose silicate polymer. 4,377,674, Cl. 527-301.000.
Bluhm, Bernhard: *See*—
Giebeler, Eberhard; Bluhm, Bernhard; Alscher, Arnold; Moraw, Klaus; Collin, Gerd; and Nilles, Heinzpeter, 4,377,040, Cl. 34-16.500.
Bobik, Carl F., to General Electric Company. Process for preparing low voltage varistors. 4,377,541, Cl. 264-56.000.
Bockoven, Brian D., to Greenberg, Michael A., a part interest. Belt buckle gun holder. 4,377,249, Cl. 224-163.000.
Boeckeler, Rudolph H.; and Prom, James R., to Freeman Chemical Corporation. Dual cure coating compositions. 4,377,457, Cl. 204-159.160.
Boehme, Richard J.: *See*—
Belew, Robert R.; and Boehme, Richard J., 4,377,266, Cl. 244-159.000.
Boeing Company, The: *See*—
Koford, James S.; Jensen, William C.; and Woo, Barry B., 4,377,862, Cl. 371-32.000.
Waldeck, Thomas A., 4,377,272, Cl. 249-160.000.
Boesch, Theo, to Wilhelm Hegenscheidt Gesellschaft mbH. Deep boring mill with a synchroneously operating headstock. 4,377,023, Cl. 29-27.00R.
Boettger, Christopher: *See*—
Meyers, John S., 4,377,383, Cl. 434-348.000.
Bolon, Donald A.; and Hallgren, John E., to General Electric Company. Decolorization of polycarbonate resins. 4,377,684, Cl. 528-486.000.
Bolt, Reginald C.; and Dowding, John G., to Molins Limited. Cigarette rod optical inspection. 4,377,743, Cl. 250-223.00R.

Bolt Technology Corporation: *See*—
Chelminski, Stephen V., 4,377,355, Cl. 405-232.000.

Bommaraju, Tilak V., to Occidental Chemical Corporation. Noble metal-coated cathode. 4,377,454, Cl. 204-95.000.

BonDurant, James M. Folded paper airplane. 4,377,052, Cl. 46-79.000.

Borg-Warner Chemicals, Inc.: *See*—
Hornbeck, Robert L., 4,377,545, Cl. 264-167.000.

Borg-Warner Corporation: *See*—
Lech, Thaddeus, Jr.; and Popchock, Richard T., 4,377,225, Cl. 192-107.00C.

Boriack, Clinton J.; and Friedli, Hans R., to Dow Chemical Company, The. Halogenated (meth) acrylate compounds. 4,377,707, Cl. 560-220.000.

Borras, Jaime A.; and Gonzalez, Ruben J., to Motorola, Inc. Transmit security system for a synthesized transceiver. 4,377,871, Cl. 455-76.000.

Boser, Ronald J.; and Watts, Henry J., to Union Special Corporation. Elastic metering device for sewing machine. 4,377,122, Cl. 112-265.100.

Botta, Artur: *See*—
Krimm, Heinrich; Buysch, Hans-Josef; and Botta, Artur, 4,377,670, Cl. 525-467.000.

Bouisset, Michel; Chignac, Michel; Grain, Claude; and Pigerol, Charles, to Sanofi. Process for introducing alkyl radicals into carbon chains having a functional group and compounds prepared by said process. 4,377,533, Cl. 260-465.100.

Bouniot, Albert; Couraud, Robert; and Lartigau, Guy, to Rhone-Poulenc Industries. Process of preparing sucroglycerides. 4,377,685, Cl. 536-119.000.

Bourland, Larry G., to Atlantic Richfield Company. Thermoplastic molding composition comprising a methyl methacrylate polymer and styrene-citraconic anhydride copolymer. 4,377,664, Cl. 525-94.000.

Bouvet, Jean-Marie: *See*—
Chevalier, Claude; Bouvet, Jean-Marie; and Parthuisot, Jean P., 4,377,226, Cl. 192-3.300.

Boylan, Francis J.; Porter, Clemmon; and Bruno, Olga D., to Drew Chemical Corporation. Defoamer composition and use thereof. 4,377,493, Cl. 252-321.000.

Braatz, Andreas, to Daimler-Benz Aktiengesellschaft. Stator for a hydrodynamic torque converter. 4,377,068, Cl. 60-342.000.

Brabets, Robert I.: *See*—
Massey, Lester G.; Brabets, Robert I.; and Abel, William A., 4,377,392, Cl. 44-51.000.

Brady, Donnie G.: *See*—
Vives, Van C.; and Brady, Donnie G., 4,377,660, Cl. 524-494.000.

Branca, Quirico; Fischli, Albert E.; and Szente, Andre, to Hoffmann-La Roche Inc. Benzodiazepine derivatives. 4,377,522, Cl. 260-239.30D.

Brand, John R., to Gulf & Western Industries, Inc. Titanium dioxide pigment treated to suppress yellowing in polymers. 4,377,417, Cl. 106-300.000.

Brandt, Lutz; Kreutzer, Karl; Rau, Karlheinz; Schmidt, Horst; and Simmat, Fritz, to Heraeus Quarzschmelze GmbH, Quarzstrasse. Method for the production of flat, transparent vitreous silica slabs of low bubble content. 4,377,405, Cl. 65-136.000.

Branson Ultrasonics Corporation: *See*—
Toth, Leslie, 4,377,428, Cl. 156-73.500.

Brauer, Hans-Werner: *See*—
Krauss, Reinhard; Maass, Horst-Dieter; and Brauer, Hans-Werner, 4,377,396, Cl. 55-59.000.

Braun, Roland J.; Carden, Gary R.; and Snyder, Keith A., to International Business Machines Corporation. Substrate for magnetic domain device. 4,377,854, Cl. 365-2.000.

Breitscheidel, Hans-Ulrich: *See*—
Alfter, Franz-Werner; and Breitscheidel, Hans-Ulrich, 4,377,614, Cl. 428-213.000.

Brekka Corporation, The: *See*—
Brekka, Thomas T.; and Stucki, Frank F., 4,377,741, Cl. 235-472.000.

Brekka, Thomas T.; and Stucki, Frank F., to Brekka Corporation, The. Apparatus for producing updated information on a tangible medium. 4,377,741, Cl. 235-472.000.

Brent, Albert: *See*—
Muenger, James R.; Child, Edward T.; and Brent, Albert, 4,377,394, Cl. 48-62.00R.

Breusov, Jury N.: *See*—
Lopukhin, Jury M.; Petrov, Rem V.; Arion, Vitaly Y.; Breusov, Jury N.; Gladysheva, Tatyana V.; Sanina, Irina V.; Lebedev, Vasily V.; Kirzon, Serafima S.; and Ivanushkin, Evgeny F., 4,377,511, Cl. 260-112.00R.

Brewer, David L.: *See*—
Green, Gary P.; Allemand, Charly D.; Brewer, David L.; Iida, Hitoshi; and Maldari, Mario A., 4,377,340, Cl. 356-237.000.

Briggs, Aubrey C., to Dravo Corporation. Automatic rail clamp. 4,377,220, Cl. 188-44.000.

Briscoe, James E.: *See*—
Seale, Virgil L.; Stanford, James R.; Briscoe, James E.; and Penny, Glenn S., 4,377,710, Cl. 564-281.000.

British Petroleum Company Limited, The: *See*—
Hancock, Ronald D.; and Howell, Ian V., 4,377,555, Cl. 423-6.000.

Bronicki, Lucien Y.: *See*—
Assaf, Gad; and Bronicki, Lucien Y., 4,377,071, Cl. 60-641.800.

Brother Kogyo Kabushiki Kaisha: *See*—
Kato, Masataka; and Oshima, Nobuyasu, 4,377,120, Cl. 112-158.00E.

Brown, Boveri & Cie AG: *See*—
Heidtmann, Uwe, 4,377,199, Cl. 165-47.000.

Brown, Ernest C.; and Buske, Walter E., to Wolverine Corporation. Apparatus for baking food products such as pizzas and the like. 4,377,109, Cl. 99-401.000.

Brown, Ernest J.: *See*—
McDermott, Richard P.; and Brown, Ernest J., 4,377,085, Cl. 72-359.000.

Brown, John F.; and Lynch, Marie E., to General Electric Company. Method for removing polychlorinated biphenyls from transformer oil. 4,377,471, Cl. 208-262.000.

Brown, Leland T.: *See*—
Toney, John J.; and Brown, Leland T., 4,377,832, Cl. 361-56.000.

Bruneel, Robert, to Syglo International S.A. Coupling assembly particularly for centrifuges. 4,377,253, Cl. 494-38.000.

Bruno, Olga D.: *See*—
Boylan, Francis J.; Porter, Clemmon; and Bruno, Olga D., 4,377,493, Cl. 252-321.000.

Bryant, Marvin P.; and Genthner, Barbara R. S., to University Patents, Inc. Microbiological production of lower aliphatic carboxylic acids. 4,377,638, Cl. 435-136.000.

Bryson, John D., to Vaportek, Inc. Air freshening device. 4,377,399, Cl. 55-226.000.

Bunnington Corporation: *See*—
Fannon, Ronald A.; and Parks, Dale B., 4,377,335, Cl. 355-3.0FU.
Parks, Dale B.; Fannon, Ronald A.; and Kosmider, Ronald T., 4,377,336, Cl. 355-3.0FU.

Burger, Jurgen; and Kasparek, Alois, to Hauni-Werke Korber & Co. KG. Apparatus for transporting filter rod sections or the like. 4,377,172, Cl. 131-282.000.

Burkner, Wolfgang, to Carl Schenck AG. Process and a device for the distribution of a conveyed flow. 4,377,230, Cl. 198-525.000.

Burroughs Corporation: *See*—
Dockal, Ronald J., 4,377,853, Cl. 364-900.000.
Legory, John E.; Gryger, Dana A.; and Drogichen, Daniel P., 4,377,863, Cl. 371-42.000.
Roesner, Bruce B., 4,377,856, Cl. 365-154.000.

Buschmann, John C.; Rasmussen, Elizabeth L.; Webster, William C.; and Veltman, Preston L., to A/S Niro Atomizer. Shaped cementitious products. 4,377,414, Cl. 106-85.000.

Bush Universal, Inc.: *See*—
Nardone, John M., 4,377,012, Cl. 12-16.400.

Buske, Walter E.: *See*—
Brown, Ernest C.; and Buske, Walter E., 4,377,109, Cl. 99-401.000.

Butera, Anthony W. Doweling jig. 4,377,357, Cl. 408-115.00R.

Butman, Thomas R., Jr., to General Electric Company. End winding support for exciter winding bar. 4,377,764, Cl. 310-260.000.

Buysch, Hans-Josef: *See*—
Krimm, Heinrich; Buysch, Hans-Josef; and Botta, Artur, 4,377,670, Cl. 525-467.000.

Cain, Gerald E., to Roto Cleaner, Inc. Cleaning device for surfaces. 4,377,018, Cl. 15-322.000.

Calvano, Joseph E. Shuttle machine tool. 4,377,097, Cl. 83-98.000.

Cambier, Craig S., to International Business Machines Corporation. Flyback voltage control. 4,377,842, Cl. 363-20.000.

Cambridge Instruments, Inc.: *See*—
Grossman, Hyman; and MacQuignon, Claude, 4,377,813, Cl. 346-33.0ME.

Campbell, John, Jr.; Russell, Larry H.; and Robinson, Philip I., to Rockwell International Corporation. Ceramic heat exchange module and apparatus and process utilizing same. 4,377,072, Cl. 60-682.000.

Canavesi, Roberto; Ghezzi, Roberto; and Tagliabue, Vittorio, to Euteco Impianti S.p.A. Oxychlorination catalyst precursor and process for its preparation. 4,377,491, Cl. 252-441.000.

Canon Kabushiki Kaisha: *See*—
Kawabata, Takashi; Hosoe, Kazuya; Shinoda, Nobuhiko; Sakai, Shinji; and Kinoshita, Takao, 4,377,742, Cl. 250-204.000.
Tamura, Yasuyuki, 4,377,332, Cl. 355-3.0DD.
Tsuji, Takao; Ichikawa, Junji; Ichihashi, Hiroo; Sugiura, Yoshinori; Nakano, Takashi; and Hirayama, Kazuhiro, 4,377,333, Cl. 355-3.0SH.

Capsulated Systems, Inc.: *See*—
Hart, Ronald L.; Work, Dale E.; Davis, Daniel; and Bayless, Robert G., 4,377,621, Cl. 428-425.800.

Carden, Gary R.: *See*—
Braun, Roland J.; Carden, Gary R.; and Snyder, Keith A., 4,377,854, Cl. 365-2.000.

Carey, John G.: *See*—
Birchall, James D.; and Carey, John G., 4,377,418, Cl. 106-306.000.

Carim, Hatim M., to Minnesota Mining and Manufacturing Company. Non-polarizable bioelectrode. 4,377,170, Cl. 128-639.000.

Carl Schenck AG.: *See*—
Burkner, Wolfgang, 4,377,230, Cl. 198-525.000.

Carlson, Alfred D.: *See*—
Herpers, Ferdinand J.; Kroll, Harley E.; Carlson, Alfred D.; and Dodge, Paul D., 4,377,017, Cl. 15-320.000.

Carlson, Karl G.: *See*—
Olson, Jan C. H.; and Carlson, Karl G., 4,377,061, Cl. 53-433.000.

Carr, Norman L.; Moon, William G.; and Prudich, Michael E., to Pittsburg & Midway Coal Mining Co., The. Coal liquefaction process. 4,377,464, Cl. 208-8.0LE.

Carroll, James J.: *See*—
Adams, William E., Jr.; and Carroll, James J., 4,377,047, Cl. 40-21.00C.

Carron, Mark S.; Greco, Carl C.; VanBrocklin, Lester P.; and Via, Francis A., to Stauffer Chemical Company. New method of disposing of the residue from the production of diaklyl phosphorochloridothionate. 4,377,559, Cl. 423-317.000.

Carruthers, James D.: *See*—
Hettinger, William P., Jr.; Carruthers, James D.; and Watkins, William D., 4,377,470, Cl. 208-120.000.

Carver, Robert G., to Don Coburn, Inc. Flapless carrier for articles. 4,377,235, Cl. 206-477.000.

Cadas, Spyridon, to Aluminium de Grece. Process and apparatus for controlling the supply of alumina to a cell for the production of aluminum by electrolysis. 4,377,452, Cl. 204-67.000.

Caw Industries, Inc.: *See*—
Willard, John W., Sr., 4,377,599, Cl. 426-310.000.

Ceil Clean Corporation, Inc.: *See*—
King, Jeffrey J., 4,377,489, Cl. 252-99.000.

Challener, Ronald T.: *See*—
Rolls, George H.; Beveridge, Andrew J.; Challener, Ronald T.; and Stuart, William, 4,377,478, Cl. 210-242.300.

Chambers, Roland A., to Marathon Oil Company. Well blowout prevention device. 4,377,206, Cl. 166-97.000.

Champion International Corporation: *See*—
Schillinger, Joseph F., 4,377,252, Cl. 229-28.00R.

Chan, John C. H., to Houston Systems Manufacturing Co., Inc. High temperature dual butterfly valve. 4,377,181, Cl. 137-584.000.

Chang, Cherng. Mass spectrometer for chemical ionization, electron impact ionization and mass spectrometry/mass spectrometry operation. 4,377,745, Cl. 250-283.000.

Chelminski, Stephen V., to Bolt Technology Corporation. Quiet bouncer driver thruster method with pressurized air chamber encircling massive bouncing piston. 4,377,355, Cl. 405-232.000.

Chen, Ying-Ho, to A. H. Robins Company, Inc. 2-Phenyl-4-[cis-2,5-dimethyl-4-(2-pyridinyl)-1-piperazinyl]quinazoline. 4,377,582, Cl. 424-251.000.

Chester, Arthur W.; and Murray, James G., to Mobil Oil Corporation. Catalyst for olefin polymerization. 4,377,497, Cl. 252-430.000.

Chester, Arthur W.; and Chu, Yung-Feng, to Mobil Oil Corporation. Alkylation of isoparaffins with olefins. 4,377,721, Cl. 585-722.000.

Chevalier, Claude; Bouvet, Jean-Marie; and Parthuisot, Jean P., to Regie Nationale des Usines Renault. Device controlling the bridging of a hydrodynamic torque converter. 4,377,226, Cl. 192-3.300.

Chevron Research Company: *See*—
Reed, Marion G., 4,377,419, Cl. 106-900.000.
Schneider, Ronald A., 4,377,604, Cl. 427-75.000.
Wallman, Per H., 4,377,466, Cl. 208-11.00R.

Chicago Bridge & Iron Company: *See*—
Bertolazzi, Luciano F., 4,377,128, Cl. 118-317.000.

Chignac, Michel: *See*—
Bouisset, Michel; Chignac, Michel; Grain, Claude; and Pigerol, Charles, 4,377,533, Cl. 260-465.100.

Child, Edward T.: *See*—
Muenger, James R.; Child, Edward T.; and Brent, Albert, 4,377,394, Cl. 48-62.00R.

Chiu, Herman S., to Union Carbide Corporation. Liquid smoke impregnated fibrous food casing. 4,377,187, Cl. 138-118.100.

Chiu, Herman S., to Union Carbide Corporation. Liquid smoke-impregnation of fibrous food casings. 4,377,606, Cl. 427-172.000.

Chodosh, Edward. Pleating and laminating. 4,377,431, Cl. 156-204.000.

Cholakian, Gary D.: *See*—
Hansen, Gary G.; and Cholakian, Gary D., 4,377,214, Cl. 177-25.000.

Chopra, Sham K., to Merck Sharp & Dohme (I.A.) Corp. Preparation of aqueous alcoholic dispersions of pH sensitive polymers and plasticizing agents and a method of enteric coating dosage forms using same. 4,377,568, Cl. 424-31.000.

Christopher, Todd J.; and Mehrotra, Gopi N., to RCA Corporation. Signal expander. 4,377,788, Cl. 330-136.000.

Chu, Yung-Feng: *See*—
Chester, Arthur W.; and Chu, Yung-Feng, 4,377,721, Cl. 585-722.000.

Chubb Panorama Limited: *See*—
Feathers, Leonard J., 4,377,163, Cl. 128-205.220.

Chuetsu Metal Works Co., Ltd.: *See*—
Hirao, Yutaka; Hata, Kunio; Hosoda, Masao; and Ishigane, Ryoichi, 4,377,424, Cl. 148-414.000.

Chugai Seiyaku Kabushiki Kaisha: *See*—
Shirakawa, Norio; Tomioka, Hiromi; Koizumi, Masuo; Takeuchi, Masaki; Sugiyama, Hiroshi; Okada, Masanori; Yoshimoto, Masahiro; Iwane, Yoshitaka; and Murakami, Yasushi, 4,377,407, Cl. 71-76.000.

Chujo, Takafumi: *See*—
Ohhata, Michinobu; Matsumura, Toshihiko; Yamasawa, Masao; Chujo, Takafumi; and Takahashi, Masayuki, 4,377,759, Cl. 307-491.000.

Ciba-Geigy Corporation: *See*—
Ackermann, Peter; Gsell, Laurenz; and Wehrli, Rudolf, 4,377,532, Cl. 260-465.00E.
Ackermann, Peter; Gsell, Laurenz; and Wehrli, Rudolf, 4,377,593, Cl. 424-282.000.
Hubele, Adolf; Eckhardt, Wolfgang; and Riebli, Peter, 4,377,587, Cl. 424-269.000.
Moser, Paul, 4,377,690, Cl. 546-19.000.
Pfeifer, Josef; and Reinehr, Dieter, 4,377,683, Cl. 528-336.000.
Zweifel, Hans; and Bellus, Daniel, 4,377,668, Cl. 525-426.000.
Zweifel, Hans; and Bellus, Daniel, 4,377,669, Cl. 525-445.000.

Cier, Andre: *See*—
Gero, Stephan; Cleophax, Jeanine; Barriere, Jean-Claude; and Cier, Andre, 4,377,704, Cl. 549-39.000.

Claycomb, Jack R. Throttling mud choke apparatus. 4,377,177, Cl. 137-15.000.

Clements, Jack T., to Standard Havens, Inc. Baghouse with on-line maintenance capability. 4,377,397, Cl. 55-97.000.

Cleophax, Jeanine: *See*—
Gero, Stephan; Cleophax, Jeanine; Barriere, Jean-Claude; and Cier, Andre, 4,377,704, Cl. 549-39.000.

Cluett, Ronald D.; and Mitchell, Richard L., to Gloucester Engineering Co., Inc. Control of tubular film size. 4,377,540, Cl. 264-23.000.

CNG Research Company: *See*—
Massey, Lester G.; Brabets, Robert I.; and Abel, William A., 4,377,392, Cl. 44-51.000.

Cobra, Inc.: *See*—
Luther, Ronald B.; Frey, Peter F.; and Sparks, Marshall F., 4,377,165, Cl. 128-214.400.

Coca-Cola Company, The: *See*—
Howell, Tony M.; and Huffman, Carl F., 4,377,520, Cl. 260-236.600.

Coflexip: *See*—
Genini, Maurice; Athe, Christian; and Aubert, Jean-Paul, 4,377,186, Cl. 138-111.000.

Collin, Gerd: *See*—
Giebeler, Eberhard; Bluhm, Bernhard; Alscher, Arnold; Morsw, Klaus; Collin, Gerd; and Nilles, Heinzpeter, 4,377,040, Cl. 34-16.500.

Collins, James H., to Shell Oil Company. Solvent resistant polymeric composition. 4,377,658, Cl. 524-425.000.

Combustion Engineering, Inc.: *See*—
Frey, Donald J., 4,377,134, Cl. 122-479.00B.

Commette, Denis S.; and Valentine, John W., to Gusmer Corporation. Apparatus for dispensing a mixture of mutually reactive liquids. 4,377,256, Cl. 239-117.000.

Communications Satellite Corporation: *See*—
Horna, Otakar A., 4,377,793, Cl. 333-165.000.

Compagnie Industrielle de Mecanismes: *See*—
Vigo, Gilles, 4,377,020, Cl. 16-329.000.

Component Manufacturing & Design, Inc.: *See*—
Biljes, William H., 4,377,180, Cl. 137-528.000.

Conoco Inc.: *See*—
Morton, Arthur W., 4,377,354, Cl. 405-171.000.

Conrad, Ernst, to Nordstjernan AB. Process for the preparation of a hydrolyzed product from whole grain and such a product. 4,377,602, Cl. 426-656.000.

Constantinescu, Spiridon. Multicolored globe adapted to make combinations between colors on multitudinous directions. 4,377,286, Cl. 273-153.00S.

Consumers Power Company: *See*—
Adams, William E., 4,377,551, Cl. 376-260.000.

Cook Paint and Varnish Company: *See*—
Wright, Howard J.; Leonard, David P.; and Etzell, Roger A., 4,377,661, Cl. 524-522.000.

Coppock, Richard A., to GTE Products Corporation. Projection optical lithography apparatus. 4,377,339, Cl. 355-27.000.

Cormier, Milton J., to University of Georgia Research Foundation, Inc. Use of psychoactive drugs in uterus to prevent pregnancy. 4,377,577, Cl. 424-247.000.

Cornelius Company, The: *See*—
McMillin, John R.; and Strandwitz, Peter, 4,377,246, Cl. 222-56.000.

Costakis, Evan E.: *See*—
Tsatsas, Georges; Costakis, Evan E.; and Foscolos, Georges V., 4,377,689, Cl. 546-15.000.

Cottell, Eric C. Production of fuel. 4,377,391, Cl. 44-51.000.

Couraud, Robert: *See*—
Bouniot, Albert; Couraud, Robert; and Lartigau, Guy, 4,377,685, Cl. 536-119.000.

Cragoe, Edward J., Jr.; Rooney, Clarence S.; and Williams, Haydn W. R., to Merck Sharp & Dohme (I.A.) Corp.; and Merck & Co., Inc. 4-(Substituted thiazolyl)-3-hydroxy-3-pyrroline-2,5-dione inhibitors of glycolic acid oxidase. 4,377,588, Cl. 424-270.000.

Craig, Gordon L.; and Cupp, Terry J., to Ford Motor Company. Fuel tank filler pipe retainer. 4,377,301, Cl. 285-62.000.

Crounse, Nathan N.; and Schmidt, Paul J., to Sterling Drug Inc. 2,4 Bis(2-indolyl-3)-4-oxobutanoic acids. 4,377,698, Cl. 548-455.000.

Crowe, Orland F.; Gaber, Richard E.; and Forbes, James R., to Liquid Carbonic Corporation. CO_2 Snow-making process. 4,377,402, Cl. 62-10.000.

Cubic Western Data: *See*—
Hayman, Charles L.; Roes, John B.; and Moore, Royal C., Jr., 4,377,828, Cl. 360-88.000.

Cupp, Terry J.: *See*—
Craig, Gordon L.; and Cupp, Terry J., 4,377,301, Cl. 285-62.000.

Currier Piano Company, Inc.: *See*—
Mayerjak, Robert J., 4,377,102, Cl. 84-184.000.

Dabbs, Albert G.: *See*—
Task, Harry L.; Genco, Louis V.; Smith, Kenneth L.; and Dabbs, Albert G., 4,377,341, Cl. 356-239.000.

Dahlberg, Reinhard, to Licentia Patent-Verwaltungs-GmbH. Method of producing silicon. 4,377,564, Cl. 423-349.000.

Daimler-Benz Aktiengesellschaft: *See*—
Abthoff, Jorg; Schuster, Hans-Dieter; Langer, Hans-Joachim; and Laszlo, Marijan, 4,377,135, Cl. 123-25.00J.
Bergmann, Horst; Pracht, Hans; and Holloh, Klaus-Dieter, 4,377,147, Cl. 123-527.000.
Brastz, Andreas, 4,377,068, Cl. 60-342.000.

Dalal, Vikram L., to University of Delaware, The. High efficiency thin-film multiple-gap photovoltaic device. 4,377,723, Cl. 136-249.000.

D'Alelio, Gaetano F.: *See*—
Waitkus, Phillip A.; and D'Alelio, Gaetano F., 4,377,536, Cl. 260-544.00N.

D'Alelio, Gaetano F., deceased (by St. Joseph Bank and Trust Company, executor); and Waitkus, Phillip A., to Plastics Engineering Company. Addition products of diacetylene-terminated polyimide derivatives and a dienophile having a terminal vinyl group. 4,377,525, Cl. 548-461.000.

D'Alelio, Gaetano F., deceased (by St. Joseph Bank & Trust Company, executor); and Waitkus, Phillip A., to Plastics Engineering Company. Polymerization products of di-acetylene-terminated polyimide derivatives. 4,377,673, Cl. 526-262.000.

Dalichow, Ernst-Wilhelm F., to Heinr. Boker GmbH & Co. Baumwerk. Cultry place setting. 4,377,035, Cl. 30-147.000.

Dammann, Jurgen: *See*—
Kaiser, Reinhard; Behre, Horst; Dammann, Jurgen; Putter, Rolf; and Vogel, Axel, 4,377,535, Cl. 260-505.00C.

Dana Corporation: *See*—
Zackrisson, Barry L., 4,377,312, Cl. 308-187.100.

Danforth, Richard L.: *See*—
Durbin, Daniel P.; Danforth, Richard L.; and Lutz, Robert G., 4,377,647, Cl. 523-518.000.

Dangschat, Holmer, to Dr. Johannes Heidenhain GmbH. Precision measuring apparatus having a measuring interval sealed from environmental influences. 4,377,036, Cl. 33-125.00A.

Daniel, Richard A.; and Geil, Ronald J., to Gould Inc. Microprocessor controlled micro-stepping chart drive. 4,377,847, Cl. 364-400.000.

Danko, Joseph A.: *See*—
Dumaine, Thomas J.; Danko, Joseph A.; and Poland, Donald R., 4,377,261, Cl. 241-222.000.

Darling, Thomas R.: *See*—
Krespan, Carl G.; and Darling, Thomas R., 4,377,705, Cl. 549-550.000.

Data General Corporation: *See*—
Wolff, Kenneth T., 4,377,810, Cl. 340-707.000.

Daudt, William H.; Frye, Cecil L.; and Hyde, James F., to Dow Corning Corporation. Method of modifying a substrate. 4,377,608, Cl. 427-350.000.

Daudt, William H.; Frye, Cecil L.; and Hyde, James F., to Dow Corning Corporation. Amorphous materials derived from aqueous metal ammine siliconate solutions. 4,377,675, Cl. 528-25.000.

Dauer, John J., Jr.: *See*—
Grunert, Kurt A.; Paton, Charles R.; Henwood, John J.; Dauer, John J., Jr.; and DeVault, Birch L., 4,377,796, Cl. 335-131.000.

Daunt, John E.; Tipton, John P.; and Adair, John E., to General Electric Company. Method and apparatus for removing material from a surface. 4,377,736, Cl. 219-121.0LH.

Davis, C. Paul; and Sandor, Joseph, to Innovative Computer Products Corp. Non-abrasive magnetic head cleaning system. 4,377,831, Cl. 360-128.000.

Davis, Daniel: *See*—
Hart, Ronald L.; Work, Dale E.; Davis, Daniel; and Bayless, Robert G., 4,377,621, Cl. 428-425.800.

DBX, Inc.: *See*—
Blackmer, David E.; and Welland, David R., 4,377,792, Cl. 333-14.000.

Debesis, John R., to Xerox Corporation. Ink jet printing machine. 4,377,814, Cl. 346-140.00R.

DeCarlo, Joseph P.; and Melancon, Bernard R., to Foxboro Company, The. Vertical axis turbine flowmeter. 4,377,091, Cl. 73-861.870.

Dee, Louis A.; and Fiske, Mary E., to United States of America, Air Force. Method and apparatus for the continuous extraction of ingredients from samples. 4,377,641, Cl. 436-178.000.

Deere & Company: *See*—
Naylor, Jimmy C.; and Norton, Richard G., 4,377,149, Cl. 123-557.000.

Deex, Oliver D., to Monsanto Company. Liquid crystal copolyesters. 4,377,681, Cl. 528-193.000.

Degussa AG: *See*—
Hentschel, Klaus; Bittner, Friedrich; Schreyer, Gerd; and Franz, Georg, 4,377,344, Cl. 366-173.000.

De Jaeger, Roger; Helioui, Moncef; and Puskaric, Emile, to Institut Mondial du Phosphate. Novel polychloroorganophazenes and process for their preparation. 4,377,558, Cl. 423-301.000.

Del Bianco, Matthew A.; and Tancredi, Henry J., to Du Pont de Nemours, E. I., and Company. Roller drive for an apparatus for automatically laminating circuit boards. 4,377,434, Cl. 156-364.000.

DeMeester, Philippe A.; Heraly, Jean-Pierre J.; and Vandenput, Pierre F., to Estorol A.G. Process and apparatus for treating photographic fixing baths. 4,377,456, Cl. 204-109.000.

Demizu, Akira: *See*—
Mitani, Tateki; and Demizu, Akira, 4,377,138, Cl. 123-179.00H.

De Santis, Raymond P., to PTX-Pentronix, Inc. Indexing mechanism for the anvil assembly of a powder-compacting press. 4,377,376, Cl. 425-78.000.

Dessau, Ralph M., to Mobil Oil Corporation. Shape selective metallic catalysis. 4,377,503, Cl. 252-455.00Z.

DeStefano, Joseph: *See*—
Shekel, Joseph; and DeStefano, Joseph, 4,377,317, Cl. 339-29.00B.

Deutsche Babcock Aktiengesellschaft: *See*—
Noack, Rolf, 4,377,119, Cl. 110-346.000.

Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt: *See*—
Sternfeld, Hans J.; Reinkenhof, Josef; and Lambrecht, Heinrich, 4,377,067, Cl. 60-39.550.

DeVault, Birch L.: *See*—
Grunert, Kurt A.; Paton, Charles R.; Henwood, John J.; Dauer, John J., Jr.; and DeVault, Birch L., 4,377,796, Cl. 335-131.000.

Diamond Shamrock Corporation: *See*—
Solomon, Frank, 4,377,496, Cl. 252-425.300.

Dickinson, Norman L. Pollution-free pressurized fluidized bed combustion utilizing a high concentration of water vapor. 4,377,066, Cl. 60-39.050.

Dinius, James H.: *See*—
Strohbeen, Irene B.; and Dinius, James H., 4,377,543, Cl. 264-120.000.

Dockal, Ronald J., to Burroughs Corporation. Peripheral controller with segmented memory buffer for interfacing 80 column card reader with host computer. 4,377,853, Cl. 364-900.000.

Dr. Johannes Heidenhain GmbH: *See*—
Dangschat, Holmer, 4,377,036, Cl. 33-125.00A.

Dodge, Paul D.: *See*—
Herpers, Ferdinand J.; Kroll, Harley E.; Carlson, Alfred D.; and Dodge, Paul D., 4,377,017, Cl. 15-320.000.

Dohi, Takashi: *See*—
Neki, Shigeo; Shinozaki, Nozomu; and Dohi, Takashi, 4,377,778, Cl. 318-341.000.

DOM-Sicherheitstechnik GmbH & Co. KG: *See*—
Wolter, Heinz, 4,377,082, Cl. 70-364.00A.

Domtar Inc.: *See*—
Liem, Albert J., 4,377,439, Cl. 162-30.100.

Don Coburn, Inc.: *See*—
Carver, Robert G., 4,377,235, Cl. 206-477.000.

Donnelly, Vincent M.; and Flamm, Daniel L., to Bell Telephone Laboratories, Incorporated. Plasma-assisted etch process with endpoint detection. 4,377,436, Cl. 156-626.000.

Doublet, Philippe; and Jullien, Georges, to Novatome. Nuclear reactor exchanger. 4,377,552, Cl. 376-405.000.

Douglas, Huey. Head protector. 4,377,009, Cl. 2-411.000.

Dow Chemical Company, The: *See*—
Baker, Richard F.; and Taylor, Otis C., 4,377,462, Cl. 204-253.000.
Boriack, Clinton J.; and Friedli, Hans R., 4,377,707, Cl. 560-220.000.

Dow Corning Corporation: *See*—
Daudt, William H.; Frye, Cecil L.; and Hyde, James F., 4,377,608, Cl. 427-350.000.
Daudt, William H.; Frye, Cecil L.; and Hyde, James F., 4,377,675, Cl. 528-25.000.
Gauthier, Laura A.; and LeGrow, Gary E., 4,377,676, Cl. 528-26.500.

Dowding, John G.: *See*—
Bolt, Reginald C.; and Dowding, John G., 4,377,743, Cl. 250-223.00R.

Drake, Eldon L., to Western Technology, Inc. Seal section for a downhole pumping unit. 4,377,763, Cl. 310-87.000.

Dravo Corporation: *See*—
Briggs, Aubrey C., 4,377,220, Cl. 188-44.000.

Dreese, Patrick C.; and Hoseney, R. Carl, to Miller Brewing Company. Method of removing hulls from brewer's spent grain. 4,377,601, Cl. 426-472.000.

Drew Chemical Corporation: *See*—
Boylan, Francis J.; Porter, Clemmon; and Bruno, Olga D., 4,377,493, Cl. 252-321.000.

Drogichen, Daniel P.: *See*—
Legory, John E.; Gryger, Dana A.; and Drogichen, Daniel P., 4,377,863, Cl. 371-42.000.

Druash, Alex F.; and Druash, Denis P. Safety razor kit. 4,377,034, Cl. 30-41.000.

Druash, Denis P.: *See*—
Druash, Alex F.; and Druash, Denis P., 4,377,034, Cl. 30-41.000.

Dubynin, Nikolai G.: *See*—
Gubin, Ivan P.; Machavariani, Sergei G.; Efremovtsev, Nikolai S.; Kovalenko, Viktor A.; Mozolev, Alexandr V.; Nikolaev, Sergei I.; Nikolaev, Georgy I.; Guriyanov, Viktor A.; Temnikov, Anatoly I.; Tyryshkin, Evgeny E.; Dubynin, Nikolai G.; Kogan, Volf Z.; Ljubkin, Anatoly P.; and Sedko, Anatoly P., 4,377,310, Cl. 299-13.000.

Dudley, Russell D.: *See*—
Areaux, Larry D.; and Dudley, Russell D., 4,377,259, Cl. 241-73.000.

Duesterhoeft, Donald A.: *See*—
Oxenreider, Terry; Duesterhoeft, Donald A.; and Erb, Edgar M., 4,377,197, Cl. 164-112.000.

Dulake, Robert F. Flying devices. 4,377,051, Cl. 46-77.000.

Dumaine, Thomas J.; Danko, Joseph A.; and Poland, Donald R., to Leesona Corporation. Granulator and improved feed means therefor. 4,377,261, Cl. 241-222.000.

Dunkers, Karl R., to Munters Corporation, The. Apparatus for equalization of overflow water and urban runoff in receiving bodies of water. 4,377,477, Cl. 210-170.000.

Dunning, Stephen C.; and Gwathmey, James T., to International Telephone and Telegraph Corporation. Time slot interchanger and control processor apparatus for use in a telephone switching network. 4,377,859, Cl. 370-58.000.

Du Pont de Nemours, E. I., and Company: *See*—
Del Bianco, Matthew A.; and Tancredi, Henry J., 4,377,434, Cl. 156-364.000.
Krespan, Carl G.; and Darling, Thomas R., 4,377,705, Cl. 549-550.000.
Nair, Kumaran M., 4,377,840, Cl. 361-320.000.

Duponteil, Daniel: *See*—
Bailly, Roland; and Duponteil, Daniel, 4,377,791, Cl. 332-9.00R.
Duracell Inc.: *See*—
Joshi, Ashok V.; and Liang, Charles C., 4,377,624, Cl. 429-191.000.
Parsen, Frank E.; and Rossler, Eleanor J., 4,377,625, Cl. 429-198.000.
Durand, William W.; Jain, Anil K.; and Peterson, Ronald E., to Honeywell Inc. Graded index Fabry-Perot optical filter device. 4,377,324, Cl. 350-166.000.
Durbin, Daniel P.; Danforth, Richard L.; and Lutz, Robert G., to Shell Oil Company. Polymer blend composition. 4,377,647, Cl. 523-518.000.
Durette, Philippe L.; and Shen, Tsung-Ying, to Merck & Co., Inc. Immunologically active dipeptidyl saccharides and methods of preparation. 4,377,570, Cl. 424-88.000.
Dynamit Nobel Aktiengesellschaft: *See*—
Alfter, Franz-Werner; and Breitscheidel, Hans-Ulrich, 4,377,614, Cl. 428-213.000.
E. R. Squibb & Sons, Inc.: *See*—
Natarajan, Sesha I.; and Ondetti, Miguel A., 4,377,701, Cl. 548-533.000.
Eagle Valley Manufacturing, Inc.: *See*—
Voss, Raymond G., 4,377,211, Cl. 172-375.000.
Eastman Kodak Company: *See*—
Mir, Jose M., 4,377,753, Cl. 250-578.000.
EC Erdolchemie GmbH: *See*—
Schleppinghoff, Bernhard, 4,377,393, Cl. 44-53.000.
Ecker, Mario E.; and Olson, Leonard T., to International Business Machines Corporation. High density interconnection means for chip carriers. 4,377,316, Cl. 339-17.0CF.
Eckert, Alton B., Jr.; and Pritchett, Wayne W., to Pitney Bowes Inc. Average power control apparatus and method. 4,377,739, Cl. 219-497.000.
Eckhardt, Wolfgang: *See*—
Hubele, Adolf; Eckhardt, Wolfgang; and Riebli, Peter, 4,377,587, Cl. 424-269.000.
Efremovtsev, Nikolai S.: *See*—
Gubin, Ivan P.; Machavariani, Sergei G.; Efremovtsev, Nikolai S.; Kovalenko, Viktor A.; Mozolev, Alexandr V.; Nikolaev, Sergei I.; Nikolaev, Georgy I.; Guriyanov, Viktor A.; Temnikov, Anatoly I.; Tyryshkin, Evgeny E.; Dubynin, Nikolai G.; Kogan, Volf Z.; Ljubkin, Anatoly P.; and Sedko, Anatoly P., 4,377,310, Cl. 299-13.000.
Eibeck, Richard E.: *See*—
Nychka, Henry R.; Hino, John B.; Eibeck, Richard E.; and Robinson, Martin A., 4,377,715, Cl. 570-123.000.
Eichelberger, Charles W.; and Wojnarowski, Robert J., to General Electric Company. Electrical resistor and fabrication thereof. 4,377,505, Cl. 252-512.000.
Eisenbrand, Gerhard, to Stiftung Deutsches Krebsforschungszentrum. Analogs of 1-(2-chloroethyl)-1-nitroso-3-(cycloheyl)-urea substituted by heterocyclic rings or alkyl radicals. 4,377,687, Cl. 544-164.000.
Ejima, Kikuo, to Kabushiki Kaisha Komatsu Seisakusho. Radiator equipped with a centrifugal fan. 4,377,203, Cl. 165-125.000.
Eklund, Lars: *See*—
Asplund, Gunnar; Eklund, Lars; and Ostlund, Bernt, 4,377,835, Cl. 361-91.000.
Electric Power Research Institute, Inc.: *See*—
Udren, Eric A., 4,377,833, Cl. 361-79.000.
Electrolux-Sigmund GmbH: *See*—
Staudt, Wilhelm; and Steier, Hans-Wido, 4,377,076, Cl. 62-395.000.
Elektronikcentralen: *See*—
Wested, Jens, 4,377,722, Cl. 136-244.000.
Elinkmann, Hans-Gerd; and Paszthory, Emmerich, to Hoechst Aktiengesellschaft. Process for preparing benzoxanthene and benzothioxanthene dyestuffs. 4,377,703, Cl. 549-24.000.
Ellames, George: *See*—
Fellner, Peter J.; Ellames, George; Floyd, Christopher D.; and Manley, Paul W., 4,377,697, Cl. 548-336.000.
Elliott, Guy R. B.; Vanderborgh, Nicholas E.; and McDaniel, Milton W. Recovery of natural gas from deep brines. 4,377,208, Cl. 166-265.000.
Elliott, John R.: *See*—
Elliott, Joseph E.; and Elliott, John R., 4,377,806, Cl. 340-347.0DD.
Elliott, Joseph E.; and Elliott, John R., to International Business Machines Corporation. Parallel to serial converter. 4,377,806, Cl. 340-347.0DD.
Elliott, Thomas R.: *See*—
Flannigan, James B.; Emfinger, Jack E.; and Elliott, Thomas R., 4,377,848, Cl. 364-433.000.
Elms, Robert T.; Saletta, Gary F.; and Mercier, Bernard J., to Westinghouse Electric Corp. Circuit interrupter with solid state digital trip unit and positive power-up feature. 4,377,836, Cl. 361-96.000.
Emfinger, Jack E.: *See*—
Flannigan, James B.; Emfinger, Jack E.; and Elliott, Thomas R., 4,377,848, Cl. 364-433.000.
EMI Limited: *See*—
Oliver, Colin C., 4,377,867, Cl. 378-19.000.
Youhill, Paul, 4,377,805, Cl. 340-347.0DD.
Engelhard Corporation: *See*—
Tse, Harold F., 4,377,495, Cl. 252-415.000.
Enso-Gutzeit Osakeytio: *See*—
Venalainen, Heikki; Rantanen, Rauno; and Puumalainen, Rertti, 4,377,869, Cl. 378-50.000.
Epstein, Martin: *See*—
Ruckel, Erwin R.; and Epstein, Martin, 4,377,510, Cl. 260-97.000.
Erb, Edgar M.: *See*—
Oxenreider, Terry; Duesterhoeft, Donald A.; and Erb, Edgar M., 4,377,197, Cl. 164-112.000.
Erickson, Edward H., to Minnesota Mining and Manufacturing Company. N-(Tetrazol-5-yl)phenazine-1-carboxamides. 4,377,579, Cl. 424-250.000.
Eriksson, Leif; and Liberman, Salomon, to Asea Aktiebolag. Multiphase blocking circuitry for electrical power supply networks. 4,377,834, Cl. 361-82.000.
Ernst, Larry M., to International Business Machines Corporation. Method and apparatus for copier quality monitoring and control. 4,377,338, Cl. 355-14.00D.
Erwin, John R. Board game apparatus. 4,377,287, Cl. 273-252.000.
Estorol A.G.: *See*—
DeMeester, Philippe A.; Heraly, Jean-Pierre J.; and Vandenput, Pierre F., 4,377,456, Cl. 204-109.000.
Etablissements Nativelle S.A.: *See*—
Tsatsas, Georges; Costakis, Evan E.; and Foscolos, Georges V., 4,377,689, Cl. 546-15.000.
Ethyl Corporation: *See*—
Keblys, Kestutis A., 4,377,713, Cl. 568-639.000.
Ettel, Victor A.: *See*—
Thomas, John A.; Jones, David L.; and Ettel, Victor A., 4,377,410, Cl. 75-112.000.
Etzell, Roger A.: *See*—
Wright, Howard J.; Leonard, David P.; and Etzell, Roger A., 4,377,661, Cl. 524-522.000.
European Optics S.p.A.: *See*—
Ferrandi, Renato, 4,377,328, Cl. 351-126.000.
Euteco Impianti S.p.A.: *See*—
Canavesi, Roberto; Ghezzi, Roberto; and Tagliabue, Vittorio, 4,377,491, Cl. 252-441.000.
Evans, Lyle B. Rotary piston engine. 4,377,136, Cl. 123-44.00C.
Everett/Charles, Inc.: *See*—
Long, Everett J., 4,377,318, Cl. 339-75.00M.
Evert, Donald A., to Honeywell Inc. Angular position sensor. 4,377,088, Cl. 73-640.000.
Exxon Research and Engineering Co.: *See*—
Achia, Biddanda U., 4,377,467, Cl. 208-33.000.
Grimes, Patrick G., 4,377,445, Cl. 204-1.00R.
Langer, Arthur W., 4,377,720, Cl. 585-527.000.
Staciokas, Leon J., 4,377,761, Cl. 310-12.000.
F. Jos. Lamb Company: *See*—
Koch, Richard L., 4,377,368, Cl. 414-748.000.
Faber, Robert V.; and Sylwester, Ronald D. Railing construction. 4,377,275, Cl. 256-69.000.
Fabris, Hubert J.: *See*—
Sponseller, David R.; Melby, Earl G.; and Fabris, Hubert J., 4,377,680, Cl. 528-123.000.
Fairchild Camera & Instrument: *See*—
Tickle, Andrew C., 4,377,857, Cl. 365-185.000.
Faiveley S.A.: *See*—
Georgelin, Alexandre, 4,377,731, Cl. 200-80.00R.
Fannon, Ronald A.; and Parks, Dale B., to Bunnington Corporation. Cryogenically assembled rolls. 4,377,335, Cl. 355-3.0FU.
Fannon, Ronald A.: *See*—
Parks, Dale B.; Fannon, Ronald A.; and Kosmider, Ronald T., 4,377,336, Cl. 355-3.0FU.
Farr, Glyn P. R., to Girling Limited. Hydraulic anti-skid systems for vehicle. 4,377,221, Cl. 188-181.00A.
Farrar, Ralph C., to Phillips Petroleum Company. Age-resistant polymers containing chemically bound antioxidant functional groups. 4,377,666, Cl. 525-132.000.
Feathers, Leonard J., to Chubb Panorama Limited. Breathing apparatus. 4,377,163, Cl. 128-205.220.
Fecher, Douglas A., to Bendix Corporation, The. Hydraulic brake booster. 4,377,105, Cl. 91-391.00R.
Feldman, Allan M.: *See*—
Trenbeath, Steven L.; Feldman, Allan M.; and Nummy, Laurence J., 4,377,530, Cl. 260-453.00P.
Fellner, Peter J.; Ellames, George; Floyd, Christopher D.; and Manley, Paul W., to G. D. Searle & Co. Imidazole hydrazone and hydrazine derivatives. 4,377,697, Cl. 548-336.000.
Fenne, Ivor: *See*—
Jarrett, Boaz A.; Fenne, Ivor; Mowbray, Dorian F.; and Mardell, John E., 4,377,139, Cl. 123-358.000.
Ferenc, Robert A., to Whelen Engineering Company, Inc. Lamp/reflector assembly. 4,377,802, Cl. 340-84.000.
Ferrandi, Renato, to European Optics S.p.A. Spectacle frame. 4,377,328, Cl. 351-126.000.
Ferrante, Joseph A.: *See*—
Lockwood, James R.; Leffel, Kenneth; and Ferrante, Joseph A., 4,377,294, Cl. 280-154.50R.
Ferrara, Louis T. Tissue filtering bath for histology. 4,377,476, Cl. 210-167.000.
Feuge, Reuben O.; and Zeringue, Hampden J., Jr., to United States of America, Agriculture. Method of purifying fatty acid ester products. 4,377,686, Cl. 536-119.000.
Fickert, Werner: *See*—
Maurer, Manfred; Orth, Winfried; and Fickert, Werner, 4,377,699, Cl. 548-469.000.
Finger, Wesley C.; and Long, Gerald B., to International Business Machines Corporation. Macro assembler process for automated circuit design. 4,377,849, Cl. 364-491.000.

Finkelstein, Manuel: *See*—
Barry, John E.; Finkelstein, Manuel; and Ross, Sidney D., 4,377,692, Cl. 546-186.000.

Finn, Bernard J.; and Yew, Ming-Chih, to General Motors Corporation. Vehicle wheel suspension. 4,377,298, Cl. 280-663.000.

Fischer, Hermann, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Deflection-compensated sheet gripper arrangement for rotary printing machine. 4,377,112, Cl. 101-246.000.

Fischer, Joseph, to National Distillers & Chemical Corp. Process for the preparation of colored powders of hydrolyzed ethylene-vinyl acetate copolymer. 4,377,650, Cl. 524-88.000.

Fischer, William F.; and Bailey, Charles A., II, to Swedlow, Inc. Plastic transparencies having improved resistance to cracking. 4,377,611, Cl. 428-192.000.

Fischli, Albert E.: *See*—
Branca, Quirico; Fischli, Albert E.; and Szente, Andre, 4,377,522, Cl. 260-239.30D.

Fisher Gesellschaft m.b.H.: *See*—
Staufer, Adolf, 4,377,297, Cl. 280-609.000.

Fiske, Mary E.: *See*—
Dee, Louis A.; and Fiske, Mary E., 4,377,641, Cl. 436-178.000.

Flagg, Rodger H. Heating device. 4,377,153, Cl. 126-285.00R.

Flamm, Daniel L.: *See*—
Donnelly, Vincent M.; and Flamm, Daniel L., 4,377,436, Cl. 156-626.000.

Flammer, Charles N.: *See*—
Friedman, Ernest H.; Flammer, Charles N.; Baker, Daniel A.; and Vamvakas, Spiro, 4,377,158, Cl. 128-1.00R.

Flannigan, James B.; Emfinger, Jack E.; and Elliott, Thomas R., to Sperry Corporation. Altitude capture mode for aircraft automatic flight control system. 4,377,848, Cl. 364-433.000.

Fleury, Georges, to Thompson-CSF. Microwave delay line incorporating a conductor with a variable cross-section for a travelling-wave tube. 4,377,770, Cl. 315-3.600.

Florence, John R. Rocket firing system. 4,377,113, Cl. 102-209.000.

Floyd, Christopher D.: *See*—
Fellner, Peter J.; Ellames, George; Floyd, Christopher D.; and Manley, Paul W., 4,377,697, Cl. 548-336.000.

FMC Corporation: *See*—
Fretz, Edward R., Jr., 4,377,653, Cl. 524-129.000.
Ragan, Marshall P., 4,377,038, Cl. 33-203.180.

Fontanes, Sylvain: *See*—
Benoit-Gonin, Roger; Berger, Jean-Luc; Fontanes, Sylvain; and Picquendar, Jean-Edgar, 4,377,760, Cl. 307-530.000.

Forbes, James R.: *See*—
Crowe, Orland F.; Gaber, Richard E.; and Forbes, James R., 4,377,402, Cl. 62-10.000.

Force, G. E.: *See*—
Grasselli, R. K.; Suresh, D. D.; Zagata, R. J.; and Force, G. E., 4,377,500, Cl. 252-432.000.

Ford Aerospace and Communication Corporation: *See*—
Smith, Bernard T.; Armstrong, Wayne T.; and Nelson, Richard D., 4,377,747, Cl. 250-370.000.

Ford Motor Company: *See*—
Craig, Gordon L.; and Cupp, Terry J., 4,377,301, Cl. 285-62.000.
Hamburg, Douglas R., 4,377,143, Cl. 123-440.000.
Hamlyn, Nigel C., 4,377,366, Cl. 414-466.000.
Irish, David C.; and Bathe, John G., Jr., 4,377,539, Cl. 261-121.00B.
Janson, David A., 4,377,093, Cl. 74-477.000.
Mangels, John A.; and Baer, John R., 4,377,542, Cl. 264-65.000.
McNamara, David A., 4,377,851, Cl. 364-571.000.

Foresight Enterprises, Incorporated: *See*—
Berg, Bernard J., 4,377,738, Cl. 219-490.000.

Foscolos, Georges V.: *See*—
Tsatsas, Georges; Costakis, Evan E.; and Foscolos, Georges V., 4,377,689, Cl. 546-15.000.

Foster, Arthur M.; and Maul, James J., to Occidental Chemical Corporation. Preparation of meta-substituted diaryl ethers. 4,377,712, Cl. 568-635.000.

Foster Grant Corporation: *See*—
Haddad, Theodore A.; Kondig, Walter; and Phillips, Richard A., 4,377,389, Cl. 8-506.000.

Fox, Gary R., to Greenwood Corp. of America. Apparatus for obtaining variegated patterns. 4,377,080, Cl. 68-205.00R.

Fox Manufacturing Company Pty. Limited: *See*—
Seller, Barry, 4,377,311, Cl. 299-75.000.

Foxboro Company, The: *See*—
DeCarlo, Joseph P.; and Melancon, Bernard R., 4,377,091, Cl. 73-861.870.

Francois, Alain, to R. George S.A. Process for the manufacture of locks of hair from synthetic fibers, device for putting this process into operation and locks of hair thus obtained. 4,377,427, Cl. 156-73.200.

Franz, Georg: *See*—
Hentschel, Klaus; Bittner, Friedrich; Schreyer, Gerd; and Franz, Georg, 4,377,344, Cl. 366-173.000.

Frederick, George L. Sealing frame for use in window case. 4,377,055, Cl. 49-388.000.

Freeman Chemical Corporation: *See*—
Boeckeler, Rudolph H.; and Prom, James R., 4,377,457, Cl. 204-159.160.

Freeman, Dennis B., to Occidental Chemical Corporation. Metal coating process and compositions. 4,377,487, Cl. 252-33.400.

Freeman, Elzie H., to United States of America, Navy. Coarse/fine digital pattern combiner for high accuracy. 4,377,807, Cl. 340-347.00P.

Freidinger, Roger M.: *See*—
Veber, Daniel F.; and Freidinger, Roger M., 4,377,515, Cl. 260-112.5LH.

Fretz, Edward R., Jr., to FMC Corporation. Mixed ether compositions containing oligomers of polyfunctional phosphine oxides: flame retardants for polymers. 4,377,653, Cl. 524-129.000.

Frey, Donald J., to Combustion Engineering, Inc. Steam temperature control with overfire air firing. 4,377,134, Cl. 122-479.00B.

Frey, Peter F.: *See*—
Luther, Ronald B.; Frey, Peter F.; and Sparks, Marshall F., 4,377,165, Cl. 128-214.400.

Frey, Richard L.: *See*—
Anderson, Roy E.; Frey, Richard L.; and Lewis, James R., 4,377,870, Cl. 455-2.000.

Frieberg, Bengt O. Reversible lock washer. 4,377,361, Cl. 411-161.000.

Friedli, Hans R.: *See*—
Boriack, Clinton J.; and Friedli, Hans R., 4,377,707, Cl. 560-220.000.

Friedman, Ernest H.; Flammer, Charles N.; Baker, Daniel A.; and Vamvakas, Spiro, to Friedman, Ernest H. Method and monitor for voice fluency. 4,377,158, Cl. 128-1.00R.

Fritsch, Werner: *See*—
Stache, Ulrich; Fritsch, Werner; Alpermann, Hans G.; and Sandow, Jurgen K., 4,377,575, Cl. 424-243.000.

Fritz, Stewart J. Apparatus for cleaning roller applicators. 4,377,175, Cl. 134-138.000.

Frohlen, Hans-Gunther: *See*—
Block, Hans-Dieter; and Frohlen, Hans-Gunther, 4,377,537, Cl. 260-969.000.

Froment, Jean-Paul, to S.A. des Etablissements Staubli. Control unit comprising electromagnets, particularly for actuating dobbies for weaving machines. 4,377,799, Cl. 335-266.000.

Frye, Cecil L.: *See*—
Daudt, William H.; Frye, Cecil L.; and Hyde, James F., 4,377,608, Cl. 427-350.000.
Daudt, William H.; Frye, Cecil L.; and Hyde, James F., 4,377,675, Cl. 528-25.000.

Fryer, Rodney I.: *See*—
Walser, Armin; and Fryer, Rodney I., 4,377,523, Cl. 260-244.400.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Sakakiyama, Ryuzo; and Usunami, Shoichi, 4,377,223, Cl. 192-3.580.

Fuji Kosan Kabushiki Kaisha: *See*—
Nakamura, Nobunosuke; and Kimoto, Hisanori, 4,377,202, Cl. 165-86.000.

Fuji Photo Film Co., Ltd.: *See*—
Mifune, Hiroyuki; Takada, Shunji; Akimura, Yoshitaka; and Fuseya, Yoshiharu, 4,377,634, Cl. 430-440.000.
Mifune, Hiroyuki; Inoue, Nobuaki; and Fuseya, Yoshiharu, 4,377,635, Cl. 430-564.000.
Yoshida, Satoshi; Takeuchi, Hideaki; Shigyo, Masamichi; Iijima, Toshio; and Ikeda, Tomoaki, 4,377,607, Cl. 427-250.000.

Fujii, Masayuki, to Nissan Motor Co., Ltd. Autoleveling device for a vehicle with a hydro-pneumatic suspension. 4,377,299, Cl. 280-708.000.

Fujimoto, Yasuo; and Yamabe, Shigeru, to Nippon Chemiphar Co., Ltd. Acetic acid derivatives. 4,377,702, Cl. 549-12.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Ueda, Ikuo; Kato, Masayuki; and Nagano, Masanobu, 4,377,580, Cl. 424-251.000.

Fujita, Mituo, to Kabushiki Kaisha Shinsei Industries. Labeler. 4,377,435, Cl. 156-384.000.

Fujita, Takao; and Makuta, Masahiro, to Nippon Suisan Kaisha, Ltd. Method of purifying eicosapentaenoic acid and its esters. 4,377,526, Cl. 260-424.000.

Fujitsu Limited: *See*—
Goto, Hiroshi; and Sugishima, Kenji, 4,377,031, Cl. 29-576.00B.
Yamamoto, Takashi, 4,377,605, Cl. 427-93.000.

Fukami, Akira: *See*—
Okamoto, Kunio; and Fukami, Akira, 4,377,400, Cl. 55-269.000.

Fukuma, Daizo; Suzuki, Shigeru; Shirota, Kensho; and Harada, Kunihiro, to Nissan Motor Company, Ltd.; and Japan Synthetic Rubber Co., Ltd. Binders for polydiene composite propellants. 4,377,678, Cl. 528-75.000.

Fukushima, Masao, to Nissan Motor Co., Ltd. Method and apparatus for reducing engine vibration induced vehicle cabin noise and resonance. 4,377,218, Cl. 180-300.000.

Fuld, Stephan; and Peterschinegg, Hans. Datum sensor for measuring elongations. 4,377,800, Cl. 338-2.000.

Fuller, R. Buckminster. Hanging storage shelf unit. 4,377,114, Cl. 108-103.000.

Furuta, Kenji, to Olympus Optical Co., Ltd. Method for detecting a specific recording position on a recording medium and an apparatus using this method. 4,377,826, Cl. 360-72.100.

Furuya, Nobuo: *See*—
Itoh, Tsutomu; Furuya, Nobuo; Ouchi, Kenji; Shimizu, Takeo; and Saitoh, Hiroshi, 4,377,603, Cl. 427-25.000.

Fuseya, Yoshiharu: *See*—
Mifune, Hiroyuki; Takada, Shunji; Akimura, Yoshitaka; and Fuseya, Yoshiharu, 4,377,634, Cl. 430-440.000.
Mifune, Hiroyuki; Inoue, Nobuaki; and Fuseya, Yoshiharu, 4,377,635, Cl. 430-564.000.

Future Teck: *See*—
Sabbota, Howard I., 4,377,164, Cl. 128-207.140.

Fydelor, Peter J.; and Taylor, David E. M., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for

Defence in Her Britannic Majesty's Government of the. Biocompatible material comprising a base polymer bulk graft polymerized with an ethylenically unsaturated carboxylic acid. 4,377,010, Cl. 3-1.400.

G. D. Searle & Co.: *See*—
Fellner, Peter J.; Eliames, George; Floyd, Christopher D.; and Manley, Paul W., 4,377,697, Cl. 548-336.000.

G + H Montage GmbH: *See*—
Gobel, Arthur; Gobel, Rudolf; and Patschke, Hartmut, 4,377,812, Cl. 343-872.000.

Gaber, Richard E.: *See*—
Crowe, Orland F.; Gaber, Richard E.; and Forbes, James R., 4,377,402, Cl. 62-10.000.

Gallaro, Anthony V.; and Hedler, Robert A., to North American Philips Consumer Electronics Corp. Data display CRT having a white-emitting screen. 4,377,768, Cl. 313-467.000.

Gancy, Alan B. Process of making calcium acetate deicing agents. 4,377,488, Cl. 252-70.000.

Gardner, Donald M.: *See*—
Serlin, Irving; and Gardner, Donald M., 4,377,612, Cl. 428-212.000.
Serlin, Irving; and Gardner, Donald M., 4,377,656, Cl. 524-413.000.

Garmong, Victor H., to Pioneer Electric Supply Co., Inc. Well pump jack with controlled counterbalancing. 4,377,092, Cl. 74-41.000.

Garrett Corporation, The: *See*—
Masai, John F.; and Jacobsen, Fred W., 4,377,025, Cl. 29-434.000.
Shadbourne, Alan P., 4,377,070, Cl. 60-602.000.

Garringer, Roy T.; and Gierut, Lacrence G., to Wescom Switching, Inc. Data distribution interface. 4,377,843, Cl. 364-200.000.

Gasland, Stein. Process for manufacturing of formed products. 4,377,440, Cl. 162-101.000.

Gauthier, Laura A.; and LeGrow, Gary E., to Dow Corning Corporation. Non-precondensed silicone-alkyd resins and a method for their preparation. 4,377,676, Cl. 528-26.500.

Gautier, Raoul L. A., to Societe Generale des Eaux Minerales de Vittel. Pitcher-like vessel with reinforced handle. 4,377,192, Cl. 150-12.000.

Gay, Michael J.; and Pace, W. David, to Motorola, Inc. Tone elimination circuit. 4,377,730, Cl. 179-170.0NC.

Geho, Walter B., to Procter & Gamble Company, The. Lipid membrane drug delivery. 4,377,567, Cl. 424-1.000.

Geil, Ronald J.: *See*—
Daniel, Richard A.; and Geil, Ronald J., 4,377,847, Cl. 364-400.000.

Geise, Howard F., to Sealed Air Corporation. Material fluidizing apparatus. 4,377,257, Cl. 239-419.300.

Genco, Louis V.: *See*—
Tauk, Harry L.; Genco, Louis V.; Smith, Kenneth L.; and Dabbs, Albert G., 4,377,341, Cl. 356-239.000.

General Battery Corporation: *See*—
Oxenreider, Terry; Duesterhoeft, Donald A.; and Erb, Edgar M., 4,377,197, Cl. 164-112.000.

General Electric Company: *See*—
Anderson, Roy E.; Frey, Richard L.; and Lewis, James R., 4,377,870, Cl. 455-2.000.
Anthony, Thomas R., 4,377,423, Cl. 148-171.000.
Bobik, Carl F., 4,377,541, Cl. 264-56.000.
Bolon, Donald A.; and Hallgren, John E., 4,377,684, Cl. 528-486.000.
Brown, John F.; and Lynch, Marie E., 4,377,471, Cl. 208-262.000.
Butman, Thomas R., Jr., 4,377,764, Cl. 310-260.000.
Daunt, John E.; Tipton, John P.; and Adair, John E., 4,377,736, Cl. 219-121.0LH.
Eichelberger, Charles W.; and Wojnarowski, Robert J., 4,377,505, Cl. 252-512.000.
Hallgren, John E., 4,377,706, Cl. 556-482.000.
Liebermann, Howard H., 4,377,622, Cl. 428-605.000.
Loucks, George R., 4,377,662, Cl. 525-394.000.
Plunkett, Allan B., 4,377,779, Cl. 318-811.000.
Ransley, Richard G.; and Sahm, William H., III, 4,377,322, Cl. 350-96.200.

General Foods Corporation: *See*—
Nugent, Frank J., 4,377,598, Cl. 426-108.000.

General Motors Corporation: *See*—
Finn, Bernard J.; and Yew, Ming-Chih, 4,377,298, Cl. 280-663.000.

General Tire & Rubber Company, The: *See*—
Sponseller, David R.; Melby, Earl G.; and Fabris, Hubert J., 4,377,680, Cl. 528-123.000.

Genini, Maurice; Athe, Christian; and Aubert, Jean-Paul, to Coflexip. Floating flexible tubes. 4,377,186, Cl. 138-111.000.

Genthner, Barbara R. S.: *See*—
Bryant, Marvin P.; and Genthner, Barbara R. S., 4,377,638, Cl. 435-136.000.

Georgelin, Alexandre, to Faiveley S.A. Device for automatically interrupting the supply of electric power to a motor and its utilization. 4,377,731, Cl. 200-80.00R.

Gero, Stephan; Cleophax, Jeanine; Barriere, Jean-Claude; and Cier, Andre, to Sanofi. Hetero-prostaglandin derivatives and processes for preparing them. 4,377,704, Cl. 549-39.000.

Gerry, Martin E. Bipolar activated magnetic pulse timer. 4,377,151, Cl. 123-618.000.

Geschonke, Hans; Goetze, Ulrich; and Kreilein, Kurt, to Wacker Chemie GmbH. Process for the polymerization of vinyl chloride according to the microsuspension process. 4,377,672, Cl. 526-203.000.

Gevers, Christophe. Piece of furniture particularly for stowing goods away, and stow-away unit formed by such pieces of furniture. 4,377,314, Cl. 312-297.000.

Ghezzi, Roberto: *See*—
Canavesi, Roberto; Ghezzi, Roberto; and Tagliabue, Vittorio, 4,377,491, Cl. 252-441.000.

Giebeler, Bernhardt F., to Bernhardt & Frederick Co., Inc. Pressure balanced ball valve device. 4,377,179, Cl. 137-494.000.

Giebeler, Eberhard; Bluhm, Bernhard; Alscher, Arnold; Moraw, Klaus; Collin, Gerd; and Nilles, Heinzpeter, to Rutgerswerke Aktiengesellschaft. Process for the modification of wood. 4,377,040, Cl. 34-16.500.

Gierut, Lacrence G.: *See*—
Garringer, Roy T.; and Gierut, Lacrence G., 4,377,843, Cl. 364-200.000.

Giesecke, Henning; Merten, Rudolf; and Rottmaier, Ludwig, to Bayer Aktiengesellschaft. Hydroxyalkyl-1,2,4-triazolidine-3,5-diones and a process for their production. 4,377,694, Cl. 548-264.000.

Gillespie, Bruce M.: *See*—
Sano, Richard M.; Steidley, John W.; Gillespie, Bruce M.; and Tinkel, Jack B., 4,377,752, Cl. 378-152.000.

Girling Limited: *See*—
Farr, Glyn P. R., 4,377,221, Cl. 188-181.00A.

Gladysheva, Tatyana V.: *See*—
Lopukhin, Jury M.; Petrov, Rem V.; Arion, Vitaly Y.; Bresnov, Jury N.; Gladysheva, Tatyana V.; Sanina, Irina V.; Lebedev, Vasily V.; Kirzon, Serafima S.; and Ivanushkin, Evgeny F., 4,377,511, Cl. 260-112.00R.

Glotzbach, Helmut, to Agfa-Gevaert AG. Apparatus for coating moving strips and a method for producing the apparatus. 4,377,129, Cl. 118-412.000.

Gloucester Engineering Co., Inc.: *See*—
Cluett, Ronald D.; and Mitchell, Richard L., 4,377,540, Cl. 264-23.000.

Gobel, Arthur; Gobel, Rudolf; and Patschke, Hartmut, to G + H Montage GmbH. Segmented protective shell for tower mounted antennas with vibration damping. 4,377,812, Cl. 343-872.000.

Gobel, Rudolf: *See*—
Gobel, Arthur; Gobel, Rudolf; and Patschke, Hartmut, 4,377,812, Cl. 343-872.000.

Godbole, Vishwas R., to American Microsystems, Inc. Bandwidth reduction method and structure for combining voice and data in a PCM channel. 4,377,860, Cl. 370-84.000.

Goebel, Franz: *See*—
Barnes, John E.; Goebel, Franz; and McHugh, William T., 4,377,033, Cl. 29-623.500.

Goetze, Ulrich: *See*—
Geschonke, Hans; Goetze, Ulrich; and Kreilein, Kurt, 4,377,672, Cl. 526-203.000.

Golben, Peter M., to United States of America, Interior. Thermally activated metal hydride sensor/actuator. 4,377,209, Cl. 169-26.000.

Goldberg, Erwin, to Northwestern University. Antigenic linear peptide compounds. 4,377,516, Cl. 260-112.50R.

Goldberg, Michel: *See*—
Ruhenstroth-Bauer, Gerhard; Goldberg, Michel; and Schneider, Hubertus, 4,377,514, Cl. 260-112.00R.

Gonzalez, Ruben J.: *See*—
Borras, Jaime A.; and Gonzalez, Ruben J., 4,377,871, Cl. 455-76.000.

Goodstein, Charles B. Self-actuating water containment barrier. 4,377,352, Cl. 405-115.000.

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Pesa, Frederick A.; and Graham, Anne M., 4,377,643, Cl. 518-713.000.

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Bouisset, Michel; Chignac, Michel; Grain, Claude; and Pigerol, Charles, 4,377,533, Cl. 260-465.100.

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Joo, Louis A.; Tucker, Kenneth W.; and Webb, Scott D., 4,377,463, Cl. 204-294.000.

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Greenwood Corp. of America: *See*—
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Kopp, Richard; Grogler, Gerhard; and Mann, Max, 4,377,644, Cl. 521-94.000.
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Legory, John E.; Gryger, Dana A.; and Drogichen, Daniel P., 4,377,863, Cl. 371-42.000.
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McCollum, Bill C.; Andrews, Leonard J.; and Lempicki, Alexander, 4,377,864, Cl. 372-41.000.
GTE Products Corporation: *See*—
Barnes, John E.; Goebel, Franz; and McHugh, William T., 4,377,033, Cl. 29-623.500.
Coppock, Richard A., 4,377,339, Cl. 355-27.000.
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Beach, David L.; and Harrison, James J., 4,377,529, Cl. 260-440.000.
Gulf & Western Industries, Inc.: *See*—
Brand, John R., 4,377,417, Cl. 106-300.000.
Gum, Clarence R.: *See*—
O'Donnell, Albert E.; and Gum, Clarence R., 4,377,499, Cl. 252-431.00R.
Gundle Holdings (Proprietary) Limited: *See*—
Struve, Friedrich, 4,377,429, Cl. 156-153.000.
Guptill, Frank E., Jr.: *See*—
Koog, Wolfgang; and Guptill, Frank E., Jr., 4,377,132, Cl. 122-7.00R.
Guriyanov, Viktor A.: *See*—
Gubin, Ivan P.; Machavariani, Sergei G.; Efremovtsev, Nikolai S.; Kovalenko, Viktor A.; Mozolev, Alexandr V.; Nikolaev, Sergei I.; Nikolaev, Georgy I.; Guriyanov, Viktor A.; Temnikov, Anatoly I.; Tyryshkin, Evgeny E.; Dubynin, Nikolai G.; Kogan, Volf Z.; Ljubkin, Anatoly P.; and Sedko, Anatoly P., 4,377,310, Cl. 299-13.000.
Gusmer Corporation: *See*—
Commette, Denis S.; and Valentine, John W., 4,377,256, Cl. 239-117.000.
Gustavsson, Karl A. L.: *See*—
Kruse, Rolf A. S.; Gustavsson, Karl A. L.; and Jansson, Karl A., 4,377,201, Cl. 165-76.000.
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Dunning, Stephen C.; and Gwathmey, James T., 4,377,859, Cl. 370-58.000.
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Khoobiar, Sargis, 4,377,501, Cl. 252-437.000.
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Granatek, Bronislaw J.; and Hall, Lawrence D., 4,377,420, Cl. 134-2.000.
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Hallen Company: *See*—
Allen, Herbert, 4,377,096, Cl. 81-3.38A.
Hallgren, John E., to General Electric Company. Polyalkoxysilylenolethers. 4,377,706, Cl. 556-482.000.
Hallgren, John E.: *See*—
Bolon, Donald A.; and Hallgren, John E., 4,377,684, Cl. 528-486.000.
Halpak Plastics Inc.: *See*—
Kaplan, Harold, 4,377,234, Cl. 206-432.000.
Hamada, Minoru: *See*—
Sakurai, Hisaya; Hamada, Minoru; and Matsuzaki, Kazuhiko, 4,377,667, Cl. 525-400.000.
Hamamatsu Systems, Inc.: *See*—
Green, Gary P.; Allemand, Charly D.; Brewer, David L.; Iida, Hitoshi; and Maldari, Mario A., 4,377,340, Cl. 356-237.000.
Hamburg, Douglas R., to Ford Motor Company. Lean air-fuel control using stoichiometric air-fuel sensors. 4,377,143, Cl. 123-440.000.
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Abrahamovich, Karen M.; Hamel, Clifford J.; Payne, Edward H.; and Weed, Dean R., 4,377,633, Cl. 430-312.000.
Hamlyn, Nigel C., to Ford Motor Company. Spare wheel carrier for a motor vehicle. 4,377,366, Cl. 414-466.000.
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Hanes, Ronald: *See*—
Pittman, Charles U., Jr.; and Hanes, Ronald, 4,377,719, Cl. 585-509.000.
Hang, Kenneth W.: *See*—
Prabhu, Ashok N.; and Hang, Kenneth W., 4,377,642, Cl. 501-20.000.
Hangai, Makoto: *See*—
Takata, Terasu; Hangai, Makoto; and Yokoyama, Yasuo, 4,377,224, Cl. 192-18.00R.
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Kasubuchi, Takeshi; Hara, Takeo; and Ozawa, Kaoru, 4,377,825, Cl. 360-48.000.
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Fukuma, Daizo; Suzuki, Shigeru; Shirota, Kensho; and Harada, Kunihiro, 4,377,678, Cl. 528-75.000.
Hardman, Harley F.: *See*—
Grasselli, Robert K.; Suresh, Dev D.; and Hardman, Harley F., 4,377,534, Cl. 260-465.300.
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King, John A., 4,377,219, Cl. 181-155.000.
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Harriger, Keith A.: *See*—
Mooney, David H., Jr.; and Harriger, Keith A., 4,377,811, Cl. 343-7.00A.
Harris Corporation: *See*—
Hershberger, David L., 4,377,725, Cl. 179-1.0GS.
Harrison, Don E.: *See*—
Pope, James M.; Wood, Susan; and Harrison, Don E., 4,377,507, Cl. 252-629.000.
Harrison, James J.: *See*—
Beach, David L.; and Harrison, James J., 4,377,528, Cl. 260-440.000.
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Hartung, Kuhn & Co. Maschinenfabrik: *See*—
Mayer, Georg; and Theilenberg, Franz, 4,377,442, Cl. 202-263.000.
Hasegawa, Hiromi: *See*—
Murakami, Noboru; Hasegawa, Hiromi; and Iwase, Yoshinobu, 4,377,095, Cl. 74-759.000.
Hasegawa, Shumpei: *See*—
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, 4,377,142, Cl. 123-440.000.

Hashimoto, Norikazu: *See*—
Sakai, Yoshio; Masuhara, Toshiaki; Minato, Osamu; Sasaki, Toshio; Katto, Hisao; Hashimoto, Norikazu; Muramatsu, Shin-ichi; and Tomozawa, Akihiro, 4,377,819, Cl. 357-59.000.
Hata, Kunio: *See*—
Hirao, Yutaka; Hata, Kunio; Hosoda, Masao; and Ishigane, Ryoichi, 4,377,424, Cl. 148-414.000.
Hattori, Tadashi: *See*—
Ueno, Yoshiki; Kawabata, Takakazu; Hattori, Tadashi; and Miura, Kazuhiko, 4,377,785, Cl. 324-378.000.
Hauni-Werke Korber & Co. KG.: *See*—
Bardenhagen, Dietrich; Hausler, Nikolaus; Niemann, Helmut; Greve, Heinz; and Schluer, Karl-Heinz, 4,377,098, Cl. 83-310.000.
Burger, Jurgen; and Kasparek, Alois, 4,377,172, Cl. 131-282.000.
Hausler, Nikolaus: *See*—
Bardenhagen, Dietrich; Hausler, Nikolaus; Niemann, Helmut; Greve, Heinz; and Schluer, Karl-Heinz, 4,377,098, Cl. 83-310.000.
Haworth, Floy, to Haworth, Juanita June. Vortex tranquilizer. 4,377,267, Cl. 244-199.000.
Haworth, Juanita June: *See*—
Haworth, Floy, 4,377,267, Cl. 244-199.000.
Haworth Mfg., Inc.: *See*—
Wilson, Harold R., 4,377,724, Cl. 174-48.000.
Haws, Ben E.: *See*—
Vandenberg, August; Vandenberg, Ben W.; Vandenberg, Andrew W.; and Haws, Ben E., 4,377,131, Cl. 119-148.000.
Hayashi, Nobuaki: *See*—
Morishita, Hajime; Kohashi, Takahiro; Nonogaki, Saburo; Akagi, Motoo; Hayashi, Nobuaki; and Uchino, Shoichi, 4,377,630, Cl. 430-176.000.
Hayashibara, Ken: *See*—
Sugimoto, Kaname; and Hayashibara, Yasushi, 4,377,513, Cl. 26-112.00R.
Hayashibara, Yasushi: *See*—
Sugimoto, Kaname; and Hayashibara, Yasushi, 4,377,513, Cl. 26-112.00R.
Hayes, Thomas J. Wrist activator. 4,377,282, Cl. 272-124.000.
Hayman, Charles L.; Roes, John B.; and Moore, Royal C., Jr., to Cubic Western Data. Ticket transport. 4,377,828, Cl. 360-88.000.
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Moriya, Takahiko; Hazuki, Yoshikazu; and Kashiwagi, Masahiro, 4,377,438, Cl. 156-643.000.
Hedler, Robert A.: *See*—
Gallaro, Anthony V.; and Hedler, Robert A., 4,377,768, Cl. 313-467.000.
Heidtmann, Uwe, to Brown, Boveri & Cie AG. Component for a heat exchanger. 4,377,199, Cl. 165-47.000.
Heinr. Boker GmbH & Co. Baumwerk: *See*—
Dalichow, Ernst-Wilhelm F., 4,377,035, Cl. 30-147.000.
Helioui, Moncef: *See*—
De Jaeger, Roger; Helioui, Moncef; and Puskaric, Emile, 4,377,558, Cl. 423-300.000.
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Henwood, John J.: *See*—
Grunert, Kurt A.; Paton, Charles R.; Henwood, John J.; Dauer, John J., Jr.; and DeVault, Birch L., 4,377,796, Cl. 335-131.000.
Heraeus Quarzschmelze GmbH, Quarzstrasse: *See*—
Brandt, Lutz; Kreutzer, Karl; Rau, Karlheinz; Schmidt, Horst; and Simmat, Fritz, 4,377,405, Cl. 65-136.000.
Heraly, Jean-Pierre J.: *See*—
DeMeester, Philippe A.; Heraly, Jean-Pierre J.; and Vandenput, Pierre F., 4,377,456, Cl. 204-109.000.
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Hergeth KG Maschinenfabrik und Apparatebau: *See*—
Peters, Franz, 4,377,021, Cl. 19-80.00R.
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Hetterich, Hermann: *See*—
Olschewski, Armin; Hetterich, Hermann; and Horling, Peter, 4,377,313, Cl. 308-216.000.
Hettinger, William P., Jr.; Carruthers, James D.; and Watkins, William D., to Ashland Oil, Inc. Immobilization of vanadia deposited on catalytic materials during carbo-metallic oil conversion. 4,377,470, Cl. 208-120.000.
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Ostermann, Peter, 4,377,228, Cl. 194-54.000.
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Himes, Glenn R., to Shell Oil Company. Dull, smooth unit soles. 4,377,655, Cl. 524-313.000.
Hino, John B.: *See*—
Nychka, Henry R.; Hino, John B.; Eibeck, Richard E.; and Robinson, Martin A., 4,377,715, Cl. 570-123.000.
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Hiraoka, Katsuyuki: *See*—
Yasui, Bompei; Miyamoto, Tomohisa; Hiraoka, Katsuyuki; and Sako, Yoshitaka, 4,377,691, Cl. 546-185.000.
Hiraoka, Tetsuo; Kobayashi, Takeo; Ishida, Noboru; and Sugawara, Shinichi, to Sankyo Company, Limited. 7-Oxo-1-azabicyclo[3.2.0-]hept-2-ene-2-carboxylic acid derivatives, their use and preparation. 4,377,591, Cl. 424-274.000.
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Tsuji, Takao; Ichikawa, Junji; Ichihashi, Hiroo; Sugiura, Yoshinori; Nakano, Takashi; and Hirayama, Kazuhiro, 4,377,333, Cl. 355-3.0SH.
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Kikuoka, Takao; Yamamoto, Hiroaki; Sasaki, Noriyoshi; Waksi, Kotaro; Murakami, Keinosuke; Ohnishi, Kazunori; Kawamura, Gou; Noguchi, Hiroshi; and Ukigaya, Fumio, 4,377,787, Cl. 324-431.000.
Hitachi, Ltd.: *See*—
Amano, Matsuo; Sugawara, Toru; Mouri, Yasunori; Aochi, Yoshikazu; and Sakamoto, Shinichi, 4,377,137, Cl. 123-179.00B.
Ishioka, Sachio; Maruyama, Eiichi; Imamura, Yoshinori; Matsubara, Hirokazu; and Horigome, Shinkichi, 4,377,628, Cl. 430-57.000.
Karino, Kimiji; and Kosuge, Tokuo, 4,377,141, Cl. 123-438.000.
Kikuoka, Takao; Yamamoto, Hiroaki; Sasaki, Noriyoshi; Waksi, Kotaro; Murakami, Keinosuke; Ohnishi, Kazunori; Kawamura, Gou; Noguchi, Hiroshi; and Ukigaya, Fumio, 4,377,787, Cl. 324-431.000.
Kiwaki, Hisakatsu, 4,377,758, Cl. 307-417.000.
Koizumi, Hideaki; and Sawakabu, Hitoshi, 4,377,342, Cl. 356-307.000.
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Saito, Toshio; Ito, Motoya; Takahashi, Noriyoshi; and Sato, Masaki, 4,377,784, Cl. 324-158.0MG.
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Tatsumi, Hideo; Kanamaru, Hisanobu; Tohkairin, Akira; Okabe, Moisei; and Kasama, Ryoji, 4,377,762, Cl. 310-42.000.
Wada, Yasuo; Ikeda, Takahide; and Tamura, Masao, 4,377,421, Cl. 148-1.500.
Yoshida, Kazufumi, 4,377,846, Cl. 364-200.000.
Hitachi Naka Seiki Kabushiki Kaisha: *See*—
Koizumi, Hideaki; and Sawakabu, Hitoshi, 4,377,342, Cl. 356-307.000.
HITCO: *See*—
Street, Sidney W.; and Beckley, Don A., 4,377,657, Cl. 524-424.000.
Hlaban, James J.: *See*—
Kaczmarzyk, Leonard M.; Hlaban, James J.; and Jackson, David M., 4,377,167, Cl. 128-285.000.
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Elinkmann, Hans-Gerd; and Paszthory, Emmerich, 4,377,703, Cl. 549-24.000.
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Kopineck, H. J.; and Tappe, Wilhelm, 4,377,746, Cl. 250-359.100.
Hoffmann-La Roche Inc.: *See*—
Branca, Quirico; Fischli, Albert E.; and Szente, Andre, 4,377,522, Cl. 260-239.30D.
Walser, Armin; and Fryer, Rodney I., 4,377,523, Cl. 260-244.400.

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Bergmann, Horst; Pracht, Hans; and Holloh, Klaus-Dieter, 4,377,147, Cl. 123-527.000.

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Nishikawa, Masao; Aoki, Takashi; and Sato, Yoichi, 4,377,217, Cl. 180-143.000.
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, 4,377,142, Cl. 123-440.000.

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Beaver, Jack L.; Schroeder, Jerry P.; and Whitney, John M., 4,377,346, Cl. 374-1.000.
Durand, William W.; Jain, Anil K.; and Peterson, Ronald E., 4,377,324, Cl. 350-166.000.
Evert, Donald A., 4,377,088, Cl. 73-640.000.
Stauffer, Norman L., 4,377,330, Cl. 354-25.000.

Hoover, Merle V., to RCA Corporation. Operational amplifier employing complementary field-effect transistors. 4,377,789, Cl. 330-253.000.

Horigome, Shinkichi: *See*—
Ishioka, Sachio; Maruyama, Eiichi; Imamura, Yoshinori; Matsubara, Hirokazu; and Horigome, Shinkichi, 4,377,628, Cl. 430-57.000.

Horikoshi, Toshiaki: *See*—
Inui, Takayasu; Ootsuka, Kazuo; Nogami, Saburo; Igarashi, Michiaki; Horikoshi, Toshiaki; and Izumi, Kazuhiro, 4,377,043, Cl. 37-18.00R.

Horling, Peter: *See*—
Olschewski, Armin; Hetterich, Hermann; and Horling, Peter, 4,377,313, Cl. 308-216.000.

Horna, Otakar A., to Communications Satellite Corporation. Digital adaptive finite impulse response filter with large number of coefficients. 4,377,793, Cl. 333-165.000.

Hornbeck, Robert L., to Borg-Warner Chemicals, Inc. Method of making corrugated reinforced thermoplastic pipe. 4,377,545, Cl. 264-167.000.

Horvath, Eduard, to Otto Bock Orthopadische Industrie KG. Artificial hand. 4,377,305, Cl. 294-106.000.

Hosaka, Takuo: *See*—
Nomura, Mitsuo; Amano, Shigeru; Okubo, Sho; Hosaka, Takuo; Shiraishi, Kunihiko; and Adachi, Ryuzi, 4,377,413, Cl. 106-76.000.

Hoseney, R. Carl: *See*—
Dreese, Patrick C.; and Hoseney, R. Carl, 4,377,601, Cl. 426-472.000.

Hoshikawa, Takeshi; and Takinami, Iwao, to Matsuo Electric Company Limited; and Osaka City. Hermetic glass-to-metal seal and method for making same. 4,377,404, Cl. 65-59.220.

Hosoda, Masao: *See*—
Hirao, Yutaka; Hata, Kunio; Hosoda, Masao; and Ishigane, Ryoichi, 4,377,424, Cl. 148-414.000.

Hosoe, Kazuya: *See*—
Kawabata, Takashi; Hosoe, Kazuya; Shinoda, Nobuhiko; Sakai, Shinji; and Kinoshita, Takao, 4,377,742, Cl. 250-204.000.

Hosomizu, Hiroshi, to Minolta Camera Kabushiki Kaisha. Electronic flash control device. 4,377,774, Cl. 315-241.00P.

Houilleres Du Bassin de Lorraine: *See*—
Tinchon, Lucien, 4,377,127, Cl. 118-306.000.

Houston Systems Manufacturing Co., Inc.: *See*—
Chan, John C. H., 4,377,181, Cl. 137-584.000.

Howe, George E. Modular table saw. 4,377,099, Cl. 83-467.00R.

Howe, Robert K.; and Lee, Len F., to Monsanto Company. Seed coated with 2-chloro-4,5-disubstituted-thiazole derivatives which are herbicidal safeners. 4,377,054, Cl. 47-57.600.

Howe, Robert K.; and Lee, Len F., to Monsanto Company. 2-Chloro-4,5-disubstituted-thiazoles useful as herbicidal safeners. 4,377,693, Cl. 548-202.000.

Howell, Ian V.: *See*—
Hancock, Ronald D.; and Howell, Ian V., 4,377,555, Cl. 423-6.000.

Howell, Tony M.; and Huffman, Carl F., to Coca-Cola Company, The. Citrus oil containing a high concentration of carotenoid pigments and method for producing same. 4,377,520, Cl. 260-236.600.

Hubele, Adolf; Eckhardt, Wolfgang; and Riebli, Peter, to Ciba-Geigy Corporation. Arylamine derivatives and use thereof as microbicides. 4,377,587, Cl. 424-269.000.

Huber, Jakob: *See*—
Pettenpaul, Ewald; Huber, Jakob; and Weidlich, Herbert, 4,377,030, Cl. 29-576.00B.

Hudson, Larry L.: *See*—
Workman, James P.; and Hudson, Larry L., 4,377,106, Cl. 92-23.000.

Huffman, Carl F.: *See*—
Howell, Tony M.; and Huffman, Carl F., 4,377,520, Cl. 260-236.600.

Huffman, Charles E., to Rockwell International Corporation. Time division demultiplexer with independent data distribution. 4,377,861, Cl. 370-112.000.

Huffman, Eric C.; and Woodall, James F., to Beckman Instruments, Inc. Centrifuge holder apparatus. 4,377,254, Cl. 494-12.000.

Huffman, Jon W. Roller mill drive. 4,377,260, Cl. 241-101.200.

Husman, George: *See*—
Helminiak, Thaddeus E.; Benner, Charles L.; Arnold, Fred E.; and Husman, George, 4,377,546, Cl. 264-232.000.

Hyde, James F.: *See*—
Daudt, William H.; Frye, Cecil L.; and Hyde, James F., 4,377,608, Cl. 427-350.000.
Daudt, William H.; Frye, Cecil L.; and Hyde, James F., 4,377,675, Cl. 528-25.000.

Ichihashi, Hiroo: *See*—
Tsuji, Takao; Ichikawa, Junji; Ichihashi, Hiroo; Sugiura, Yoshinori; Nakano, Takashi; and Hirayama, Kazuhiro, 4,377,333, Cl. 355-3.0SH.

Ichikawa, Junji: *See*—
Tsuji, Takao; Ichikawa, Junji; Ichihashi, Hiroo; Sugiura, Yoshinori; Nakano, Takashi; and Hirayama, Kazuhiro, 4,377,333, Cl. 355-3.0SH.

Igarashi, Michiaki: *See*—
Inui, Takayasu; Ootsuka, Kazuo; Nogami, Saburo; Igarashi, Michiaki; Horikoshi, Toshiaki; and Izumi, Kazuhiro, 4,377,043, Cl. 37-18.00R.

Igaue, Takamitsu: *See*—
Suzuki, Migaku; and Igaue, Takamitsu, 4,377,615, Cl. 428-213.000.

Iida, Hitoshi: *See*—
Green, Gary P.; Allemand, Charly D.; Brewer, David L.; Iida, Hitoshi; and Maidari, Mario A., 4,377,340, Cl. 356-237.000.

Iijima, Toshio: *See*—
Yoshida, Satoshi; Takeuchi, Hideaki; Shigyo, Masamichi; Iijima, Toshio; and Ikeda, Tomoaki, 4,377,607, Cl. 427-250.000.

Ikeda, Masaki; Nishino, Atsushi; and Suzuki, Tadashi, to Matsushita Electric Industrial Company, Limited. Infrared radiator. 4,377,618, Cl. 428-323.000.

Ikeda, Takahide: *See*—
Wada, Yasuo; Ikeda, Takahide; and Tamura, Masao, 4,377,421, Cl. 148-1.500.

Ikeda, Tomoaki: *See*—
Yoshida, Satoshi; Takeuchi, Hideaki; Shigyo, Masamichi; Iijima, Toshio; and Ikeda, Tomoaki, 4,377,607, Cl. 427-250.000.

Ikehata, Takao: *See*—
Yamashita, Kasane; Ikehata, Takao; Tate, Kazuhiko; and Nakahara, Keisuke, 4,377,483, Cl. 210-670.000.

Ikei, Akira; Akahama, Motoharu; Wada, Tokisuke; and Onogi, Takashi, to Onkyo Kabushiki Kaisha. Loudspeaker diaphragm and process for producing same. 4,377,617, Cl. 428-214.000.

Illinois Tool Works Inc.: *See*—
Peterson, Francis C., 4,377,359, Cl. 411-112.000.

Imahashi, Issei, to Telmec Co., Ltd. Method for registering a mask pattern in a photo-etching apparatus for semiconductor devices. 4,377,028, Cl. 29-574.000.

Imamura, Yoshinori: *See*—
Ishioka, Sachio; Maruyama, Eiichi; Imamura, Yoshinori; Matsubara, Hirokazu; and Horigome, Shinkichi, 4,377,628, Cl. 430-57.000.

Immuno Aktiengesellschaft fur Chemisch-Medizinische Produkte: *See*—
Schwarz, Otto; Linnau, Yendra; Loblich, Franz; and Seelich, Thomas, 4,377,572, Cl. 424-101.000.

Imperial Chemical Industries Limited: *See*—
Birchall, James D.; and Carey, John G., 4,377,418, Cl. 106-306.000.

Inanaga, Takuzi: *See*—
Kamimura, Teturo; Komatsubara, Masahiro; Ando, Shizuo; and Inanaga, Takuzi, 4,377,829, Cl. 360-96.500.

Innothera: *See*—
Aurousseau, Michel E. M., 4,377,592, Cl. 424-275.000.

Innovative Computer Products Corp.: *See*—
Davis, C. Paul; and Sandor, Joseph, 4,377,831, Cl. 360-128.000.

Inoue, Minoru: *See*—
Kogure, Shigeru; Momosaki, Eishi; and Inoue, Minoru, 4,377,765, Cl. 310-312.000.

Inoue, Nobuaki: *See*—
Mifune, Hiroyuki; Inoue, Nobuaki; and Fuseya, Yoshiharu, 4,377,635, Cl. 430-564.000.

Inoue, Yasusuke: *See*—
Kohyama, Fuzimasa; Inoue, Yasusuke; and Akase, Sigeyuki, 4,377,302, Cl. 285-334.000.

Institut Mondial du Phosphate: *See*—
De Jaeger, Roger; Helioui, Moncef; and Puskaric, Emile, 4,377,558, Cl. 423-300.000.

Inter-Probe, Inc.: *See*—
Blomgren, Oscar C., Jr.; and Renken, Henry A., 4,377,839, Cl. 361-233.000.

International Business Machines Corporation: *See*—
Abrahamovich, Karen M.; Hamel, Clifford J.; Payne, Edward H.; and Weed, Dean R., 4,377,633, Cl. 430-312.000.
Braun, Roland J.; Carden, Gary R.; and Snyder, Keith A., 4,377,854, Cl. 365-2.000.
Cambier, Craig S., 4,377,842, Cl. 363-20.000.
Ecker, Mario E.; and Olson, Leonard T., 4,377,316, Cl. 339-17.0CF.
Elliott, Joseph E.; and Elliott, John R., 4,377,806, Cl. 340-347.0DD.
Ernst, Larry M., 4,377,338, Cl. 355-14.00D.
Finger, Wesley C.; and Long, Gerald B., 4,377,849, Cl. 364-491.000.
Lotspiech, Jeffrey B.; and Wohler, Wayne L., 4,377,803, Cl. 382-9.000.
Markham, Harvey R.; and Spivey, Paul R., 4,377,845, Cl. 364-200.000.

International Flavors & Fragrances Inc.: *See*—
Yoshida, Takao, 4,377,714, Cl. 568-819.000.

International Harvester Co.: *See—*
Kukla, Laurence J., 4,377,841, Cl. 362-80.000.
International Standard Electric Corporation: *See—*
Kornaker, Walter, 4,377,767, Cl. 313-412.000.
Lenz, Hartmut; and Thaler, Helmut, 4,377,766, Cl. 313-244.000.
International Telephone and Telegraph Corporation: *See—*
Dunning, Stephen C.; and Gwathmey, James T., 4,377,859, Cl. 370-58.000.
Treiber, Robert, 4,377,858, Cl. 370-24.000.
Intimate Jewels, Inc.: *See—*
Block, Alvin, 4,377,078, Cl. 63-2.000.
Inui, Takayasu; Ootsuka, Kazuo; Nogami, Saburo; Igarashi, Michiaki; Horikoshi, Toshiaki; and Izumi, Kazuhiro, to Kabushiki Kaisha Komatsu Seisakusho. Semi-automatic hydraulic excavator. 4,377,043, Cl. 37-18.00R.
Irish, David C.; and Bathe, John G., Jr., to Ford Motor Company. Carburetor air bleed control. 4,377,539, Cl. 261-121.00B.
Iseki & Co., Ltd.: *See—*
Matsumoto, Hajime, 4,377,110, Cl. 99-489.000.
Ishibe, Hideomi, to Nippon Seisen Co., Ltd. Stainless steel short fiber and process for preparing the same. 4,377,409, Cl. 75-0.50R.
Ishida, Noboru: *See—*
Hiraoka, Tetsuo; Kobayashi, Takeo; Ishida, Noboru; and Sugawara, Shinichi, 4,377,591, Cl. 424-274.000.
Ishida, Yasuhiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fuel mixture heating device of an internal combustion engine. 4,377,148, Cl. 123-549.000.
Ishigane, Ryoichi: *See—*
Hirao, Yutaka; Hata, Kunio; Hosoda, Masao; and Ishigane, Ryoichi, 4,377,424, Cl. 148-414.000.
Ishikawa, Masaru: *See—*
Hanmyo, Masayuki; Ishikawa, Masaru; and Mizuoka, Seishi, 4,377,347, Cl. 374-139.000.
Ishioka, Sachio; Maruyama, Eiichi; Imamura, Yoshinori; Matsubara, Hirokazu; and Horigome, Shinkichi, to Hitachi, Ltd. Electrophotographic member with α-Si and H. 4,377,628, Cl. 430-57.000.
Isobe, Minoru; Kikuchi, Hiroshi; Teshima, Minoru; and Kodama, Tadasi, to Oki Electric Industry Co., Ltd. Printer head for serial dot printer. 4,377,348, Cl. 400-124.000.
Ito, Motoya: *See—*
Saito, Toshio; Ito, Motoya; Takahashi, Noriyoshi; and Sato, Masaki, 4,377,784, Cl. 324-158.0MG.
Ito, Toshio: *See—*
Takami, Toshiji; Ito, Toshio; and Kawaguchi, Fusako, 4,377,265, Cl. 244-153.00R.
Itoh, Kunio: *See—*
Sugino, Takashi; Wada, Masaru; Shimizu, Hirokazu; and Itoh, Kunio, 4,377,865, Cl. 372-45.000.
Itoh, Tsutomu; Furuya, Nobuo; Ouchi, Kenji; Shimizu, Takeo; and Saitoh, Hiroshi, to Onoda Cement Company, Limited. Method and apparatus for electrostatic powder coating. 4,377,603, Cl. 427-25.000.
ITT: *See—*
Lawford, Victor N., 4,377,809, Cl. 340-623.000.
ITT Industries, Inc.: *See—*
Schopper, Bernd; Tandler, Peter; and Lowe, Derek, 4,377,176, Cl. 137-493.200.
Ivanushkin, Evgeny F.: *See—*
Lopukhin, Jury M.; Petrov, Rem V.; Arion, Vitaly Y.; Breusov, Jury N.; Gladysheva, Tatyana V.; Sanina, Irina V.; Lebedev, Vasily V.; Kirzon, Serafima S.; and Ivanushkin, Evgeny F., 4,377,511, Cl. 260-112.00R.
Iwahashi, Haruo: *See—*
Tarumi, Noriyoshi; Kimura, Kiyoshi; and Iwahashi, Haruo, 4,377,629, Cl. 430-62.000.
Iwai, Tadashi; Kawahito, Takashi; and Tokuse, Masahiro, to Ube Industries, Ltd. Method of preparing polycarbosilanes. 4,377,677, Cl. 528-35.000.
Iwane, Yoshitaka: *See—*
Shirakawa, Norio; Tomioka, Hiromi; Koizumi, Masuo; Takeuchi, Masaki; Sugiyama, Hiroshi; Okada, Masanori; Yoshimoto, Masahiro; Iwane, Yoshitaka; and Murakami, Yasushi, 4,377,407, Cl. 71-76.000.
Iwase, Yoshinobu: *See—*
Murakami, Noboru; Hasegawa, Hiromi; and Iwase, Yoshinobu, 4,377,095, Cl. 74-759.000.
Iwashita, Yuji: *See—*
Ajisaka, Katsumi; and Iwashita, Yuji, 4,377,512, Cl. 260-112.00B.
Izumi, Kazuhiro: *See—*
Inui, Takayasu; Ootsuka, Kazuo; Nogami, Saburo; Igarashi, Michiaki; Horikoshi, Toshiaki; and Izumi, Kazuhiro, 4,377,043, Cl. 37-18.00R.
Izumi, Masao, to Nissan Motor Company, Limited. Ventilation grille structure. 4,377,107, Cl. 98-40.00V.
Jackson, David M.: *See—*
Kaczmarzyk, Leonard M.; Hlaban, James J.; and Jackson, David M., 4,377,167, Cl. 128-285.000.
Jackson, Lester L. Boat stabilizer apparatus. 4,377,123, Cl. 114-126.000.
Jackson, Richard W.: *See—*
Seelenbinder, Terry G.; Jackson, Richard W.; and Kajohn, Thomas D., Jr., 4,377,331, Cl. 354-300.000.
Jacobsen, Fred W.: *See—*
Masai, John F.; and Jacobsen, Fred W., 4,377,025, Cl. 29-434.000.
Jagenberg-Werke AG: *See—*
Zodrow, Rudolf; and Mohn, Hans-Werner, 4,377,432, Cl. 156-215.000.
Jain, Anil K.: *See—*
Durand, William W.; Jain, Anil K.; and Peterson, Ronald E., 4,377,324, Cl. 350-166.000.
Jakabhazy, Stephen Z., to Abcor, Inc. Blended, polymeric, matrix membrane and process of making and using same. 4,377,481, Cl. 210-500.200.
James River-Dixie/Northern, Inc.: *See—*
Pawlowski, Thomas D., 4,377,237, Cl. 206-630.000.
Janc, Robert V.; Robins, David S.; and Retzer, Michael H., to Motorola, Inc. Time multiplexed Loran signal processing apparatus. 4,377,866, Cl. 375-94.000.
Jansen, David A., to Ford Motor Company. Shift mechanism for a five speed transaxle transmission. 4,377,093, Cl. 74-477.000.
Janssen Pharmaceutica, N.V.: *See—*
Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. Th., 4,377,578, Cl. 424-250.000.
Jansson, Karl A.: *See—*
Kruse, Rolf A. S.; Gustavsson, Karl A. L.; and Jansson, Karl A., 4,377,201, Cl. 165-76.000.
Japan EP Rubber Co., Ltd.: *See—*
Makino, Kenya; Sakurai, Hideo; Watanabe, Masaru; and Nishimura, Toshiyuki, 4,377,671, Cl. 526-124.000.
Japan Synthetic Rubber Co., Ltd.: *See—*
Fukuma, Daizo; Suzuki, Shigeru; Shirota, Kensho; and Harada, Kunihiro, 4,377,678, Cl. 528-75.000.
Jardine, Douglas M., to Kaman Sciences Corporation. Economizer refrigeration cycle space heating and cooling system and process. 4,377,074, Cl. 62-183.000.
Jarrett, Boaz A.; Fenne, Ivor; Mowbray, Dorian F.; and Mardell, John E., to Lucas Industries Limited. Pumping systems. 4,377,139, Cl. 123-358.000.
Jeco Co., Ltd.: *See—*
Uga, Kozo, 4,377,740, Cl. 377-2.000.
Jenkins, Oliver J.: *See—*
Mayfield, Charles W.; and Jenkins, Oliver J., 4,377,304, Cl. 292-283.000.
Jensen, William C.: *See—*
Koford, James S.; Jensen, William C.; and Woo, Barry B., 4,377,862, Cl. 371-32.000.
Jensen, William E., to United States of America, Air Force. Signal compressor apparatus. 4,377,755, Cl. 377-63.000.
Jesernig, Rudolph W.; and Tenisci, Anthony. Pivoted weight supported frame exercise device. 4,377,281, Cl. 272-120.000.
Jimae, James. Brush rack. 4,377,239, Cl. 211-65.000.
Jin, Sungho; and Tiefel, Thomas H., to Bell Telephone Laboratories, Incorporated. Magnetically actuated device comprising an Fe-Mo-Ni magnetic element. 4,377,797, Cl. 335-153.000.
Johansson, Folke L.; and Svenning, Bengt F. S., to Atlas Copco Aktiebolag. Adjustable flow restricting valve. 4,377,183, Cl. 137-606.000.
Johansson, Karl B. V., to Alfa-Laval AB. Plate heat exchanger. 4,377,204, Cl. 165-166.000.
John Crane-Houdaille, Inc.: *See—*
Netzel, James P., 4,377,290, Cl. 277-38.000.
Johnson, Leland R. Tag holding bracket. 4,377,046, Cl. 40-16.400.
Johnson, Raymond, to Becton, Dickinson and Company. Generation of microaerophilic atmosphere. 4,377,554, Cl. 422-239.000.
Johnson, Robert M.; and Melling, Elmer M., to National Gypsum Company. Reinforced cement sheet product containing wollastonite for reduced shrinkage. 4,377,415, Cl. 106-90.000.
Johnson, Ted C., Jr. Apparatus for loading and unloading railway cars. 4,377,369, Cl. 444-786.000.
Johnston, David B. R.: *See—*
Rasmusson, Gary H.; Johnston, David B. R.; and Arth, Glen E., deceased, 4,377,584, Cl. 424-258.000.
Jones, David L.: *See—*
Thomas, John A.; Jones, David L.; and Ettel, Victor A., 4,377,410, Cl. 75-112.000.
Jones, David W.: *See—*
Shaw, Francis; and Jones, David W., 4,377,243, Cl. 220-210.000.
Jones, John P., to Purex Corporation. Post emulsifiable fluorescent penetrant. 4,377,492, Cl. 252-301.190.
Joo, Louis A.; Tucker, Kenneth W.; and Webb, Scott D., to Great Lakes Carbon Corporation. Controlled atmosphere processing of TiB_2/carbon composites. 4,377,463, Cl. 204-294.000.
Josephson, Louis, to American Hardware & Paint Co., Inc. Pivot for damper assembly. 4,377,350, Cl. 403-161.000.
Joshi, Ashok V.; and Liang, Charles C., to Duracell Inc. Novel cathodes for primary solid electrolyte cells. 4,377,624, Cl. 429-191.000.
Joy Manufacturing Company: *See—*
Bailey, Edward A.; and Ordway, James F., 4,377,213, Cl. 175-211.000.
Jullien, Georges: *See—*
Doublet, Philippe; and Jullien, Georges, 4,377,552, Cl. 376-405.000.
Jung, Helen Yuki: *See—*
Jung, Jung D., 4,377,008, Cl. 2-403.000.
Jung, Jung D., to Yi, Chicksu Thomas; and Jung, Helen Yuki. Article of clothing. 4,377,008, Cl. 2-403.000.
K. H. Freeman Pty. Ltd.: *See—*
Sweeney, Nevin J.; and Seale, Kenneth C., 4,377,649, Cl. 524-49.000.
K & S Industries, Inc.: *See—*
Krug, Charles C., 4,377,044, Cl. 37-245.000.
Kabbe, Hans-Joachim: *See—*
vor der Bruck, Dieter; and Kabbe, Hans-Joachim, 4,377,518, Cl. 260-156.000.

Kabushiki Kaisha Cosmos Enterprise: *See*—
Yasui, Bompei; Miyamoto, Tomohisa; Hiraoka, Katsuyuki; and Sako, Yoshitaka, 4,377,691, Cl. 546-185.000.

Kabushiki Kaisha Ekijibishon: *See*—
Yamaguchi, Kinichiro, 4,377,191, Cl. 150-0.500.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Ejima, Kikuo, 4,377,203, Cl. 165-125.000.
Inui, Takayasu; Ootsuka, Kazuo; Nogami, Saburo; Igarashi, Michiaki; Horikoshi, Toshiaki; and Izumi, Kazuhiro, 4,377,043, Cl. 37-18.00R.

Kabushiki Kaisha Shinsei Industries: *See*—
Fujita, Mituo, 4,377,435, Cl. 156-384.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Kogure, Shigeru; Momosaki, Eishi; and Inoue, Minoru, 4,377,765, Cl. 310-312.000.
Tatsushi, Asakawa; and Shinji, Morozumi, 4,377,781, Cl. 323-299.000.

Kaczmarzyk, Leonard M.; Hlaban, James J.; and Jackson, David M., to Kimberly-Clark Corporation. Easily removable tampon. 4,377,167, Cl. 128-285.000.

Kadija, Igor V.; and Woodard, Kenneth E., Jr., to Olin Corporation. V-Shaped sandwich-type cell with reticulate electodes. 4,377,455, Cl. 204-98.000.

Kadlic, Thomas P., to Vingt-Et-Un Corporation. Playing card dispenser. 4,377,285, Cl. 273-148.00A.

Kadowaki, Kunio: *See*—
Oniki, Tetsuya; and Kadowaki, Kunio, 4,377,146, Cl. 123-520.000.

Kaiser, Reinhard; Behre, Horst; Dammann, Jurgen; Putter, Rolf; and Vogel, Axel, to Bayer Aktiengesellschaft. Process for the preparation of nitro-T-acid (8-nitro-naphthalene-1,3,6-trisulphonic acid). 4,377,535, Cl. 260-505.00C.

Kajohn, Thomas D., Jr.: *See*—
Seelenbinder, Terry G.; Jackson, Richard W.; and Kajohn, Thomas D., Jr., 4,377,331, Cl. 354-300.000.

Kaman Sciences Corporation: *See*—
Jardine, Douglas M., 4,377,074, Cl. 62-183.000.

Kamimura, Teturo; Komatsubara, Masahiro; Ando, Shizuo; and Inanaga, Takuzi, to Pioneer Electronic Corporation. Player for magnetic tape cartridge recordings. 4,377,829, Cl. 360-96.500.

Kaminski, Elton G., to Stolle Corporation, The. Press apparatus having resilient stop blocks. 4,377,084, Cl. 72-325.000.

Kanamaru, Hisanobu: *See*—
Tatsumi, Hideo; Kanamaru, Hisanobu; Tohkairin, Akira; Okabe, Moisei; and Kasama, Ryoji, 4,377,762, Cl. 310-42.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Wakabayashi, Hiroshi, 4,377,663, Cl. 525-64.000.

Kang, Kenneth S.; and Veeder, George T., to Merck & Co., Inc. Polysaccharide S-60 and bacterial fermentation process for its preparation. 4,377,636, Cl. 435-101.000.

Kao, Lin, to Sound Engineering (Far East) Limited. Infrared intrusion alarm system. 4,377,808, Cl. 340-527.000.

Kaplan, Harold, to Halpak Plastics Inc. Multiple compartment banding sleeve. 4,377,234, Cl. 206-432.000.

Karino, Kimiji; and Kosuge, Tokuo, to Hitachi, Ltd. Low speed fuel supply system for a carburetor. 4,377,141, Cl. 123-438.000.

Karl Thomae Gesellschaft mit beschrankter Haftung: *See*—
Schmidt, Gunther; and Bergamaschi, Mario, 4,377,576, Cl. 424-244.000.

Kasama, Ryoji: *See*—
Tatsumi, Hideo; Kanamaru, Hisanobu; Tohkairin, Akira; Okabe, Moisei; and Kasama, Ryoji, 4,377,762, Cl. 310-42.000.

Kashihara, Takao: *See*—
Masakatsu, Ohguchi; Shizuki, Tatsuhiko; and Kashihara, Takao, 4,377,682, Cl. 528-301.000.

Kashiwagi, Masahiro: *See*—
Moriya, Takahiko; Hazuki, Yoshikazu; and Kashiwagi, Masahiro, 4,377,438, Cl. 156-643.000.

Kasparek, Alois: *See*—
Burger, Jurgen; and Kasparek, Alois, 4,377,172, Cl. 131-282.000.

Kasubuchi, Takeshi; Hara, Takeo; and Ozawa, Kaoru, to Sharp Kabushiki Kaisha. Data control system for storing digital and audio information on a magnetic tape. 4,377,825, Cl. 360-48.000.

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Katto, Hisao: *See*—
Sakai, Yoshio; Masuhara, Toshiaki; Minato, Osamu; Sasaki, Toshio; Katto, Hisao; Hashimoto, Norikazu; Muramatsu, Shin-ichi; and Tomozawa, Akihiro, 4,377,819, Cl. 357-59.000.

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Kawaguchi, Fusako: *See*—
Takami, Toshiji; Ito, Toshio; and Kawaguchi, Fusako, 4,377,265, Cl. 244-153.00R.

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Kawamura, Gou: *See*—
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Kennis, Ludo E. J.: *See*—
Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. Th., 4,377,578, Cl. 424-250.000.

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Metcalf, Eric; Woollven, Jack; Spens, Stephen N.; and Kett, Brian L. A., 4,377,782, Cl. 324-52.000.

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Kaczmarzyk, Leonard M.; Hlaban, James J.; and Jackson, David M., 4,377,167, Cl. 128-285.000.
Strohbeen, Irene B.; and Dinius, James H., 4,377,543, Cl. 264-120.000.

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Hiroshi, Takase; and Kimura, Tadashi, 4,377,325, Cl. 350-423.000.

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Kinberger, James. Infant cradle. 4,377,011, Cl. 5-102.000.

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King, Jeffrey J., to Ceil Clean Corporation, Inc. Inorganic persulfate cleaning solution for acoustic materials. 4,377,489, Cl. 252-99.000.

King, John A., to Harman International Industries. Loudspeaker having apertured acoustic impedance frontal loading element. 4,377,219, Cl. 181-155.000.

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Kipp, Carl E., Jr., to Paygro, Inc. Method and apparatus for agitating and intermixing aerobic thermophilical composting organic waste materials. 4,377,258, Cl. 241-27.000.

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Lopukhin, Jury M.; Petrov, Rem V.; Arion, Vitaly Y.; Breusov, Jury N.; Gladysheva, Tatyana V.; Sanina, Irina V.; Lebedev, Vasily V.; Kirzon, Serafima S.; and Ivanushkin, Evgeny F., 4,377,511, Cl. 260-112.00R.

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Muraji, Takashi; and Kitamura, Hiroshi, 4,377,174, Cl. 132-9.000.

Kiwaki, Hisakstsu, to Hitachi, Ltd. Magnetic amplifying apparatus. 4,377,758, Cl. 307-417.000.

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Kleps, Robert A. Towel supporting fixture. 4,377,240, Cl. 211-87.000.

Klotz, Marvin R., to Standard Oil Company (Indiana). Synthesis of crystalline aluminosilicate molecular sieves. 4,377,502, Cl. 252-455.00Z.

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Kobayashi, Hideyuki, to Aisin Seiki Kabushiki Kaisha. Brake booster. 4,377,069, Cl. 60-547.100.

Kobayashi, Takeo: *See*—
Hiraoka, Tetsuo; Kobayashi, Takeo; Ishida, Noboru; and Sugawara, Shinichi, 4,377,591, Cl. 424-274.000.
Kobayashi, Yuko, to Olympus Optical Co., Ltd. Macro lens system. 4,377,326, Cl. 350-471.000.
Koch, Richard L., to F. Jos. Lamb Company. Escapement mechanism. 4,377,368, Cl. 414-748.000.
Kochanowski, George A. Apparatus for recovering waste heat from exhaust gas flowing through an exhaust pipe. 4,377,200, Cl. 165-76.000.
Kodama, Tadasi: *See*—
Isobe, Minoru; Kikuchi, Hiroshi; Teshima, Minoru; and Kodama, Tadasi, 4,377,348, Cl. 400-124.000.
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Kofahl, William M. Tubing anchor. 4,377,207, Cl. 166-212.000.
Koford, James S.; Jensen, William C.; and Woo, Barry B., to Boeing Company, The. Method of error control in asynchronous communications. 4,377,862, Cl. 371-32.000.
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Gubin, Ivan P.; Machavariani, Sergei G.; Efremovtsev, Nikolai S.; Kovalenko, Viktor A.; Mozolev, Alexandr V.; Nikolaev, Sergei I.; Nikolaev, Georgy I.; Guriyanov, Viktor A.; Temnikov, Anatoly I.; Tyryshkin, Evgeny E.; Dubynin, Nikolai G.; Kogan, Volf Z.; Ljubkin, Anatoly P.; and Sedko, Anatoly P., 4,377,310, Cl. 299-13.000.
Kogure, Shigeru; Momosaki, Eishi; and Inoue, Minoru, to Kabushiki Kaisha Suwa Seikosha. Mode coupled tuning fork type quartz crystal vibrator and method of tuning. 4,377,765, Cl. 310-312.000.
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Kohl, Paul A., to Bell Telephone Laboratories, Incorporated. Electrolytic gold plating. 4,377,448, Cl. 204-46.00G.
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Kohyama, Fuzimasa; Inoue, Yasusuke; and Akase, Sigeyuki, to Nippon Steel Corporation. Threaded joint with high gas-leak-tightness for oil and gas well pipe. 4,377,302, Cl. 285-334.000.
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Kolongowski, Sidney C. Bow holder. 4,377,270, Cl. 248-441.00R.
Kolze, Bruce A.; and Kolze, Melvin W. Furnace for burning particulate wood waste material. 4,377,115, Cl. 110-234.000.
Kolze, Bruce A.; and Kolze, Melvin W. Particulate waste wood firing system. 4,377,117, Cl. 110-248.000.
Kolze, Melvin W.: *See*—
Kolze, Bruce A.; and Kolze, Melvin W., 4,377,115, Cl. 110-234.000.
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Kondig, Walter: *See*—
Haddad, Theodore A.; Kondig, Walter; and Phillips, Richard A., 4,377,389, Cl. 8-506.000.
Konemann, Bernd; Mucha, Joachim; and Zwiehoff, Gunther, to Siemens Aktiengesellschaft. Logic module for integrated digital circuits. 4,377,757, Cl. 307-303.000.
Konigshofen, Heinrich: *See*—
Wassen, Jurgen; and Konigshofen, Heinrich, 4,377,700, Cl. 548-475.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Ohhata, Michinobu; Matsumura, Toshihiko; Yamasawa, Masao; Chujo, Takafumi; and Takahashi, Masayuki, 4,377,759, Cl. 307-491.000.
Tarumi, Noriyoshi; Kimura, Kiyoshi; and Iwahashi, Haruo, 4,377,629, Cl. 430-62.000.
Konrad, Joseph D. Belt surfacing tool. 4,377,081, Cl. 69-6.500.
Koog, Wolfgang; and Guptill, Frank E., Jr., to Texaco Development Corp. Synthesis gas cooler and waste heat boiler. 4,377,132, Cl. 122-7.00R.
Koper, Harry F.: *See*—
Mocenter, Michael E.; and Koper, Harry F., 4,377,744, Cl. 250-231.05E.
Kopineck, H. J.; and Tappe, Wilhelm, to Hoesch Werke Aktiengesellschaft. Device for detecting surface flaws of rapidly moving sheet material. 4,377,746, Cl. 250-359.100.
Kopp, Richard; Grogler, Gerhard; and Mann, Max, to Bayer Aktiengesellschaft. Mixed anhydrides of isocyanates and carboxylic acids, mixtures thereof with carboxylic acids, and the use thereof as blowing agents for the production of cellular plastics. 4,377,644, Cl. 521-94.000.
Koppers Company, Inc.: *See*—
Lowell, Philip S., 4,377,557, Cl. 423-242.000.
Korenko, Michael K., to United States of America, Energy. Duct and cladding alloy. 4,377,553, Cl. 420-584.000.
Kornaker, Walter, to International Standard Electric Corporation. Device for adjusting the electron beams of a color-picture tube. 4,377,767, Cl. 313-412.000.
Kosmider, Ronald T.: *See*—
Parks, Dale B.; Fannon, Ronald A.; and Kosmider, Ronald T., 4,377,336, Cl. 355-3.0FU.
Kosuge, Tokuo: *See*—
Karino, Kimiji; and Kosuge, Tokuo, 4,377,141, Cl. 123-438.000.
Kotaka, Kazunari: *See*—
Yamaguchi, Masumi; Kumagai, Yoshimi; and Kotaka, Kazunari, 4,377,733, Cl. 219-10.55B.
Kovalenko, Gerald E., to United States of America, Navy. Dual dependent stores ejector assembly for angular rate and position control. 4,377,103, Cl. 89-1.50R.
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Gubin, Ivan P.; Machavariani, Sergei G.; Efremovtsev, Nikolai S.; Kovalenko, Viktor A.; Mozolev, Alexandr V.; Nikolaev, Sergei I.; Nikolaev, Georgy I.; Guriyanov, Viktor A.; Temnikov, Anatoly I.; Tyryshkin, Evgeny E.; Dubynin, Nikolai G.; Kogan, Volf Z.; Ljubkin, Anatoly P.; and Sedko, Anatoly P., 4,377,310, Cl. 299-13.000.
Kovaleski, Joseph J.; and Bauer, Gordon L., to Wyrepak Industries, Inc. Spool handling device. 4,377,264, Cl. 242-25.00R.
Krauss, Reinhard; Maass, Horst-Dieter; and Brauer, Hans-Werner, to Metallgesellschaft AG. Process of purifying exhaust air laden with organic pollutants. 4,377,396, Cl. 55-59.000.
Kreilein, Kurt: *See*—
Geschonke, Hans; Goetze, Ulrich; and Kreilein, Kurt, 4,377,672, Cl. 526-203.000.
Krespan, Carl G.; and Darling, Thomas R., to Du Pont de Nemours, E. I., and Company. Perfluorodiglycidyl ethers and precursors therefor. 4,377,705, Cl. 549-550.000.
Kreutzer, Karl: *See*—
Brandt, Lutz; Kreutzer, Karl; Rau, Karlheinz; Schmidt, Horst; and Simmat, Fritz, 4,377,405, Cl. 65-136.000.
Krimm, Heinrich; Buysch, Hans-Josef; and Botta, Artur, to Bayer Aktiengesellschaft. Copolymers based on aliphatic polycarbonates and lactams. 4,377,670, Cl. 525-467.000.
Krofta, Milos, to Lenox Institute for Research, Inc. Apparatus and method for clarification of water using combined flotation and filtration processes. 4,377,485, Cl. 210-704.000.
Kroll, Harley E.: *See*—
Herpers, Ferdinand J.; Kroll, Harley E.; Carlson, Alfred D.; and Dodge, Paul D., 4,377,017, Cl. 15-320.000.
Kronenberg, Stanley; Levine, Harry; McLaughlin, William L.; and Siebentritt, Carl R., to United States of America, Army. Optical waveguide dosimeter. 4,377,751, Cl. 250-474.100.
Kroy Unshrinkable Wools, Limited: *See*—
Mains, Frank, 4,377,388, Cl. 8-128.00R.
Kruckenberg, Winfried: *See*—
Schundehutte, Karl H.; Reel, Henning; and Kruckenberg, Winfried, 4,377,390, Cl. 8-671.000.
Krueger, Peter L. Ring guard. 4,377,079, Cl. 63-15.800.
Krug, Charles C., to K & S Industries, Inc. Snow thrower with dual controls. 4,377,044, Cl. 37-245.000.
Kruse, Rolf A. S.; Gustavsson, Karl A. L.; and Jansson, Karl A., to Aktiebolaget Bahco Ventilation. Arrangement in a heat recovery unit. 4,377,201, Cl. 165-76.000.
Kuhr, Albert F., to United States Gypsum Company. Concealed ceiling system with accessible ceiling panels. 4,377,059, Cl. 52-98.000.
Kukla, Laurence J., to International Harvester Co. High intensity discharge lighting system. 4,377,841, Cl. 362-80.000.
Kumagai, Yoshimi: *See*—
Yamaguchi, Masumi; Kumagai, Yoshimi; and Kotaka, Kazunari, 4,377,733, Cl. 219-10.55B.
Kunii, Shusaku. Ball point pen. 4,377,349, Cl. 401-115.000.
Kuo, Chang-Kiang; and Tsaur, Shyh-Chang, to Texas Instruments Incorporated. High density electrically programmable ROM. 4,377,818, Cl. 357-23.000.
Kuperman, Gilbert G.; and Lewis, Donald E., to United States of America, Air Force. Multi-channel longitudinal video tape recording. 4,377,824, Cl. 360-10.300.
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Takita, Hitoshi; Mukaida, Yutaka; Noda, Sakuo; and Kobayashi, Hidetoshi, 4,377,594, Cl. 424-309.000.
Kurowski, Casimir J., to Western Electric Co., Inc. Breakaway registration pins. 4,377,626, Cl. 430-5.000.
Lach, Dietrich: *See*—
Hahn, Erwin; Lach, Dietrich; Schneider, Kurt; Strickler, Rainer; and Streicher, Rolf, 4,377,387, Cl. 8-94.170.
Lakeshore Commercial Finance Corporation: *See*—
Rossetti, James J., 4,377,244, Cl. 220-268.000.
Lambrecht, Heinrich: *See*—
Sternfeld, Hans J.; Reinkenhof, Josef; and Lambrecht, Heinrich, 4,377,067, Cl. 60-39.550.
Lancaster Colony Corporation: *See*—
Lockwood, James R.; Leffel, Kenneth; and Ferrante, Joseph A., 4,377,294, Cl. 280-154.50R.
Langer, Arthur W., to Exxon Research and Engineering Co. Preparation of linear olefin products. 4,377,720, Cl. 585-527.000.
Langer, Hans-Joachim: *See*—
Abthoff, Jorg; Schuster, Hans-Dieter; Langer, Hans-Joachim; and Laszlo, Marijan, 4,377,135, Cl. 123-25.000.
La Pierre, Rene B.; and Gorring, Robert L., to Mobil Oil Corporation. Sulfur- and nitrogen-containing hydrocarbon feed hydrocracking over ZSM-20. 4,377,468, Cl. 208-111.000.
Laros, Timothy J.; and Pick, Richard D., to Atlantic Richfield Company. Method for concentrating the exinite group macerals from coal by froth flotation. 4,377,473, Cl. 209-167.000.

Larsen, Aubrey A.; and Owens, Donald A., to Mead Johnson & Company. N-Methyl-D-glucamine salt of with 3,4-dihydro-5-methyl-6-(2-methylpropyl)-4-oxothieno[2,3-d]pyrimidine-2-carboxylic acid. 4,377,583, Cl. 424-251.000.

Larsen, Howard J., to Wisconsin Alumni Research Foundation. Method for increasing milk production. 4,377,596, Cl. 426-2.000.

Lartigau, Guy: *See*—
Bouniot, Albert; Couraud, Robert; and Lartigau, Guy, 4,377,685, Cl. 536-119.000.

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Lathrop, John C.; and Laudig, Ronald C., to AMP Incorporated. Coaxial connector. 4,377,320, Cl. 339-177.00R.

Latsch, Reinhard, to Robert Bosch GmbH. Method and apparatus for closed-loop ignition time control. 4,377,140, Cl. 123-415.000.

Laudig, Ronald C.: *See*—
Lathrop, John C.; and Laudig, Ronald C., 4,377,320, Cl. 339-177.00R.

Laughlin, Sidney J. Rotary filter for fiber product. 4,377,401, Cl. 55-290.000.

Lautenschlager, Hans-Heiner; Betzing, Hans; Stoll, Brigitte; and Probst, Manfred, to A. Nattermann & Cie GmbH. ω-(2-Oxo-benzazolinyl)-alkanoic acid derivatives. 4,377,695, Cl. 548-305.000.

LaVanture, Mark D.; and Walker, George L., to Mobil Oil Corporation. Clarification of black phosphoric acid with phosphoric acid rinse water. 4,377,561, Cl. 423-321.00R.

Lavi, Yoav, to National Semiconductor Corporation. Content-addressable memory. 4,377,855, Cl. 365-49.000.

Lawford, Victor N., to ITT. Liquid level system. 4,377,809, Cl. 340-623.000.

Layh, Ricky L. Pipeline padding machine and method. 4,377,365, Cl. 414-334.000.

Leaphart, John L. Disposable grass catcher. 4,377,063, Cl. 56-202.000.

Lebedev, Vasily V.: *See*—
Lopukhin, Jury M.; Petrov, Rem V.; Arion, Vitaly Y.; Breusov, Jury N.; Gladysheva, Tatyana V.; Sanina, Irina V.; Lebedev, Vasily V.; Kirzon, Serafima S.; and Ivanushkin, Evgeny F., 4,377,511, Cl. 260-112.00R.

Lech, Thaddeus, Jr.; and Popchock, Richard T., to Borg-Warner Corporation. Clutch driven plate assembly with variable friction area. 4,377,225, Cl. 192-107.00C.

Lee, Harold H., to University of Toledo. Tissue culture device for mass cell culture. 4,377,639, Cl. 435-285.000.

Lee, Len F.: *See*—
Howe, Robert K.; and Lee, Len F., 4,377,054, Cl. 47-57.600.
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Leesona Corporation: *See*—
Arends, Albert W.; Pickard, George L.; West, George A.; and Russell, Edward J., 4,377,377, Cl. 425-155.000.
Dumaine, Thomas J.; Danko, Joseph A.; and Poland, Donald R., 4,377,261, Cl. 241-222.000.

Lefebvre, Jean J., to Qit-Fer et Titane Inc. Furnace electrode seal assembly. 4,377,289, Cl. 277-12.000.

Leffel, Kenneth: *See*—
Lockwood, James R.; Leffel, Kenneth; and Ferrante, Joseph A., 4,377,294, Cl. 280-154.50R.

Legory, John E.; Gryger, Dana A.; and Drogichen, Daniel P., to Burroughs Corporation. Synchronization loss tolerant cyclic error checking method and apparatus. 4,377,863, Cl. 371-42.000.

LeGrow, Gary E.: *See*—
Gauthier, Laura A.; and LeGrow, Gary E., 4,377,676, Cl. 528-26.500.

Leininger, James C., to Phillips Petroleum Company. Polyolefin stabilization. 4,377,651, Cl. 524-101.000.

Lemman, Cecil L. Apparatus for uprighting a motorized two-wheeled vehicle. 4,377,295, Cl. 280-303.000.

Lempicki, Alexander: *See*—
McCollum, Bill C.; Andrews, Leonard J.; and Lempicki, Alexander, 4,377,864, Cl. 372-41.000.

Lenox Institute for Research, Inc.: *See*—
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Lenton, Kenneth G., to Versatile Cornat Corporation. Hard facing machine. 4,377,126, Cl. 118-47.000.

Lenz, Hartmut; and Thaler, Helmut, to International Standard Electric Corporation. Frame for unit module of a vacuum-fluorescent display. 4,377,766, Cl. 313-244.000.

Leonard, David P.: *See*—
Wright, Howard J.; Leonard, David P.; and Etzell, Roger A., 4,377,661, Cl. 524-522.000.

Leray, Pierre: *See*—
Noirel, Yves M.; Blineau, Joseph; Leray, Pierre; and Bauduin, Jean-Pierre, 4,377,822, Cl. 358-139.000.

Lesher, George Y.; and Page, Donald F., to Sterling Drug Inc. Use of 4-[4(or 3)-aminophenyl]pyridines as cardiotonic agents. 4,377,585, Cl. 424-263.000.

L'Etat Francais, Represente par le Secre-d-Etat aux Postes et Telecommunications: *See*—
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LeVeen, Harry H. Method of control of gastrointestinal bleeding. 4,377,573, Cl. 424-177.000.

Levenson, Michael K., to Pyrodex Corporation. Pyrotechnic process. 4,377,426, Cl. 149-109.600.

Levey, Gustave S.; Reeves, Clarence C.; and Owens, Donald R., to Speeflo Manufacturing Corporation. Electrostatic spray gun apparatus. 4,377,838, Cl. 361-228.000.

Levine, Harry: *See*—
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Reiss, Harold, 4,377,232, Cl. 206-44.110.

Lewis, Donald E.: *See*—
Kuperman, Gilbert G.; and Lewis, Donald E., 4,377,824, Cl. 360-10.300.

Lewis, James R.: *See*—
Anderson, Roy E.; Frey, Richard L.; and Lewis, James R., 4,377,870, Cl. 455-2.000.

Liang, Charles C.: *See*—
Joshi, Ashok V.; and Liang, Charles C., 4,377,624, Cl. 429-191.000.

Liberman, Salomon: *See*—
Eriksson, Leif; and Liberman, Salomon, 4,377,834, Cl. 361-82.000.

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Dahlberg, Reinhard, 4,377,564, Cl. 423-349.000.

Liebermann, Howard H., to General Electric Company. Method for producing compacts and cladding from glassy metallic alloy filaments by warm extrusion. 4,377,622, Cl. 428-605.000.

Liem, Albert J., to Domtar Inc. Pulp mill recovery. 4,377,439, Cl. 162-30.100.

Lin, Ching-Yu: *See*—
Hirayama, Chikara; and Lin, Ching-Yu, 4,377,460, Cl. 204-195.00S.

Lindberg, Gunnar B., to Rader Companies, Inc. Apparatus for separating particulate or lump material by size. 4,377,474, Cl. 209-279.000.

Linde Aktiengesellschaft: *See*—
Pocrnja, Anton; and Streich, Martin, 4,377,073, Cl. 60-693.000.

Linder, Ernst; Muller, Klaus; and Maurer, Helmut, to Robert Bosch GmbH. Sensor system. 4,377,086, Cl. 73-35.000.

Linnau, Yendra: *See*—
Schwarz, Otto; Linnau, Yendra; Loblich, Franz; and Seelich, Thomas, 4,377,572, Cl. 424-101.000.

Liquid Carbonic Corporation: *See*—
Crowe, Orland F.; Gaber, Richard E.; and Forbes, James R., 4,377,402, Cl. 62-10.000.

Ljubkin, Anatoly P.: *See*—
Gubin, Ivan P.; Machavariani, Sergei G.; Efremovtsev, Nikolai S.; Kovalenko, Viktor A.; Mozolev, Alexandr V.; Nikolaev, Sergei I.; Nikolaev, Georgy I.; Guriyanov, Viktor A.; Temnikov, Anatoly I.; Tyryshkin, Evgeny E.; Dubynin, Nikolai G.; Kogan, Volf Z.; Ljubkin, Anatoly P.; and Sedko, Anatoly P., 4,377,310, Cl. 299-13.000.

Loblich, Franz: *See*—
Schwarz, Otto; Linnau, Yendra; Loblich, Franz; and Seelich, Thomas, 4,377,572, Cl. 424-101.000.

Lockwood, James R.; Leffel, Kenneth; and Ferrante, Joseph A., to Lancaster Colony Corporation. Vehicle fender and support bar. 4,377,294, Cl. 280-154.50R.

Logan Manufacturing Company: *See*—
Thompson, James A.; and Beeley, Micheal G., 4,377,094, Cl. 74-710.500.

Long, Everett J., to Everett/Charles, Inc. Low insertion force electrical interface assembly and actuable interface assembly therefor. 4,377,318, Cl. 339-75.00M.

Long, Gerald B.: *See*—
Finger, Wesley C.; and Long, Gerald B., 4,377,849, Cl. 364-491.000.

Lopukhin, Jury M.; Petrov, Rem V.; Arion, Vitaly Y.; Breusov, Jury N.; Gladysheva, Tatyana V.; Sanina, Irina V.; Lebedev, Vasily V.; Kirzon, Serafima S.; and Ivanushkin, Evgeny F. Preparation for control of T-system of immunity and method for producing same. 4,377,511, Cl. 260-112.00R.

Lord Corporation: *See*—
Hannibal, Alan J., 4,377,386, Cl. 464-69.000.

Lortone, Inc.: *See*—
Pincha, Philip J., 4,377,057, Cl. 51-359.000.

Lotspiech, Jeffrey B.; and Wohler, Wayne L., to International Business Machines Corporation. Algorithm for the segmentation of printed fixed pitch documents. 4,377,803, Cl. 382-9.000.

Loucks, George R., to General Electric Company. Block copolymers of polyphenylene oxides and sterically-hindered aromatic polycarbonates. 4,377,662, Cl. 525-394.000.

Lovejoy, Curtis N., to Napco, Inc. Tab plater for circuit boards or the like. 4,377,461, Cl. 204-198.000.

Low, Peter G. S. Lighter mechanism. 4,377,378, Cl. 431-140.000.

Lowe, Derek: *See*—
Schopper, Bernd; Tandler, Peter; and Lowe, Derek, 4,377,176, Cl. 137-493.200.

Lowell, Philip S., to Koppers Company, Inc. Process for removal of sulfur oxides from waste gases. 4,377,557, Cl. 423-242.000.

Lucas Industries Limited: *See*—
Jarrett, Boaz A.; Fenne, Ivor; Mowbray, Dorian F.; and Mardell, John E., 4,377,139, Cl. 123-358.000.

Luther Medical Products, Inc.: *See*—
Luther, Ronald B.; Frey, Peter F.; and Sparks, Marshall F., 4,377,165, Cl. 128-214.400.

Luther, Ronald B.; Frey, Peter F.; and Sparks, Marshall F., to Luther Medical Products, Inc.; and Cobra, Inc. Cannula needle for catheter. 4,377,165, Cl. 128-214.400.

Lutz, Robert G.: *See*—
Durbin, Daniel P.; Danforth, Richard L.; and Lutz, Robert G., 4,377,647, Cl. 523-518.000.

Luz, David W., to RCA Corporation. Duty-cycle controlled inverter power supply for a television receiver. 4,377,776, Cl. 315-411.000.

Lynch, Marie E.: *See—*
Brown, John F.; and Lynch, Marie E., 4,377,471, Cl. 208-262.000.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See—*
Fischer, Hermann, 4,377,112, Cl. 101-246.000.

M. Schaerer A.G.: *See—*
Rais, Arnold, 4,377,108, Cl. 99-290.000.

Maass, Horst-Dieter: *See—*
Krauss, Reinhard; Maass, Horst-Dieter; and Brauer, Hans-Werner, 4,377,396, Cl. 55-59.000.

MacDougall, Alan R., to AMP Incorporated. Low insertion force dip connector. 4,377,319, Cl. 339-75.00M.

Machavariani, Sergei G.: *See—*
Gubin, Ivan P.; Machavariani, Sergei G.; Efremovtsev, Nikolai S.; Kovalenko, Viktor A.; Mozolev, Alexandr V.; Nikolaev, Sergei I.; Nikolaev, Georgy I.; Guriyanov, Viktor A.; Temnikov, Anatoly I.; Tyryshkin, Evgeny E.; Dubynin, Nikolai G.; Kogan, Volf Z.; Ljubkin, Anatoly P.; and Sedko, Anatoly P., 4,377,310, Cl. 299-13.000.

Mackay, William B.; and Smith, Reginald W., to Queen's University at Kingston. Hadfield's steel containing 2% vanadium. 4,377,422, Cl. 148-137.000.

MacQuignon, Claude: *See—*
Grossman, Hyman; and MacQuignon, Claude, 4,377,813, Cl. 346-33.0ME.

Magnetic Peripherals Inc.: *See—*
Patel, Dilip C., 4,377,830, Cl. 360-98.000.

Mahoney, Kenneth J. Basketball backboard reinforcing assembly. 4,377,283, Cl. 273-1.50R.

Mains, Frank, to Kroy Unshrinkable Wools, Limited. Deep immersion shrinkproofing of wool. 4,377,388, Cl. 8-128.00R.

Makino, Kenya; Sakurai, Hideo; Watanabe, Masaru; and Nishimura, Toshiyuki, to Japan EP Rubber Co., Ltd. Process for producing olefinic copolymer rubbers. 4,377,671, Cl. 526-124.000.

Makuta, Masahiro: *See—*
Fujita, Takao; and Makuta, Masahiro, 4,377,526, Cl. 260-424.000.

Maldari, Mario A.: *See—*
Green, Gary P.; Allemand, Charly D.; Brewer, David L.; Iida, Hitoshi; and Maldari, Mario A., 4,377,340, Cl. 356-237.000.

Malson, John R., Sr. Pendulum action cultivating hoe. 4,377,212, Cl. 172-376.000.

Mangels, John A.; and Baer, John R., to Ford Motor Company. Method of forming a densified silicon nitride article. 4,377,542, Cl. 264-65.000.

Mankekar, Ajit D. Cryogenic heater. 4,377,133, Cl. 122-31.00A.

Manley, Paul W.: *See—*
Fellner, Peter J.; Ellames, George; Floyd, Christopher D.; and Manley, Paul W., 4,377,697, Cl. 548-336.000.

Mann, Max: *See—*
Kopp, Richard; Grogler, Gerhard; and Mann, Max, 4,377,644, Cl. 521-94.000.

Mannesmann Aktiengeselischaft: *See—*
Barmann, Hans, 4,377,278, Cl. 266-197.000.

Marathon Oil Company: *See—*
Chambers, Roland A., 4,377,206, Cl. 166-97.000.

Mardell, John E.: *See—*
Jarrett, Boaz A.; Fenne, Ivor; Mowbray, Dorian F.; and Mardell, John E., 4,377,139, Cl. 123-358.000.

Markham, Harvey R.; and Spivey, Paul R., to International Business Machines Corporation. Optional machine inhibition for feature malfunction. 4,377,845, Cl. 364-200.000.

Marsico, Joseph W., Jr.: *See—*
Tomcufcik, Andrew S.; Wright, William B., Jr.; and Marsico, Joseph W., Jr., 4,377,589, Cl. 424-270.000.

Marulic, Walter J.: *See—*
Hallam, Keith J.; and Marulic, Walter J., 4,377,058, Cl. 52-45.000.

Maruyama, Eiichi: *See—*
Ishioka, Sachio; Maruyama, Eiichi; Imamura, Yoshinori; Matsubara, Hirokazu; and Horigome, Shinkichi, 4,377,628, Cl. 430-57.000.

Masai, John F.; and Jacobsen, Fred W., to Garrett Corporation, The. Method of mounting heat exchanger support system. 4,377,025, Cl. 29-434.000.

Masakatsu, Ohguchi; Shizuki, Tatsuhiko; and Kashihara, Takao, to Toyo Boseki Kabushiki Kaisha. Copolyesters. 4,377,682, Cl. 528-301.000.

Mashiko, Yoji; Takano, Hirozo; Abe, Haruhiko; Asai, Sotoju; Mizuguchi, Kazuo; and Nomoto, Sumio, to Mitsubishi Denki Kabushiki Kaisha. Method for forming patterns by plasma etching. 4,377,734, Cl. 219-121.0PE.

Massachusetts Institute of Technology: *See—*
Wurtman, Richard J., 4,377,595, Cl. 424-319.000.

Massey-Ferguson Services N.V.: *See—*
Old, John L., 4,377,300, Cl. 280-758.000.

Massey, Lester G.; Brabets, Robert I.; and Abel, William A., to CNG Research Company. Coal composition. 4,377,392, Cl. 44-51.000.

Masuhara, Toshiaki: *See—*
Sakai, Yoshio; Masuhara, Toshiaki; Minato, Osamu; Sasaki, Toshio; Katto, Hisao; Hashimoto, Norikazu; Muramatsu, Shin-ichi; and Tomozawa, Akihiro, 4,377,819, Cl. 357-59.000.

Matsko, Joseph J.; and Wafer, John A., to Westinghouse Electric Corp. Circuit interrupter with overtemperature trip device. 4,377,837, Cl. 361-105.000.

Matsubara, Hirokazu: *See—*
Ishioka, Sachio; Maruyama, Eiichi; Imamura, Yoshinori; Matsubara, Hirokazu; and Horigome, Shinkichi, 4,377,628, Cl. 430-57.000.

Matsumoto, Hajime, to Iseki & Co., Ltd. Auto-control equipment of hull-removing roll in rice-hulling machines. 4,377,110, Cl. 99-489.000.

Matsumura, Toshihiko: *See—*
Ohhata, Michinobu; Matsumura, Toshihiko; Yamasawa, Masao; Chujo, Takafumi; and Takahashi, Masayuki, 4,377,759, Cl. 307-491.000.

Matsuo Electric Company Limited: *See—*
Hoshikawa, Takeshi; and Takinami, Iwao, 4,377,404, Cl. 65-59.220.

Matsushita Electric Industrial Company, Limited: *See—*
Ikeda, Masaki; Nishino, Atsushi; and Suzuki, Tadashi, 4,377,618, Cl. 428-323.000.
Neki, Shigeo; Shinozaki, Nozomu; and Dohi, Takashi, 4,377,778, Cl. 318-341.000.
Sugino, Takashi; Wada, Masaru; Shimizu, Hirokazu; and Itoh, Kunio, 4,377,865, Cl. 372-45.000.

Matsushita Electric Works, Ltd.: *See—*
Suzuki, Yoshiharu, 4,377,804, Cl. 340-310.00A.

Matsuzaki, Kazuhiko: *See—*
Sakurai, Hisaya; Hamada, Minoru; and Matsuzaki, Kazuhiko, 4,377,667, Cl. 525-400.000.

Mattel, Inc.: *See—*
Kimmell, Steven D.; and Murphy, Jack P., deceased, 4,377,441, Cl. 202-153.000.

Mattox, Donald L.: *See—*
Welling, John R.; and Mattox, Donald L., 4,377,198, Cl. 165-32.000.

Maul, James J.: *See—*
Foster, Arthur M.; and Maul, James J., 4,377,712, Cl. 568-635.000.

Maul, Peter L.; and Robertson, Albert E., to American Colloid Co.; and United Cement Co. Masonry cement composition, masonry construction and method. 4,377,416, Cl. 106-98.000.

Maurer, Helmut: *See—*
Linder, Ernst; Muller, Klaus; and Maurer, Helmut, 4,377,086, Cl. 73-35.000.

Maurer, Manfred; Orth, Winfried; and Fickert, Werner, to Rutgerswerke Aktiengesellschaft. 5-Chloro-indole preparation. 4,377,699, Cl. 548-469.000.

Max-Planck-Gesellschaft zur Foerderung der Wissenschaften E.V.: *See—*
Ruhenstroth-Bauer, Gerhard; Goldberg, Michel; and Schneider, Hubertus, 4,377,514, Cl. 260-112.00R.

Mayer, Georg; and Theilenberg, Franz, to Hartung, Kuhn & Co. Maschinenfabrik. System for coupling a quenching car to a hood car and for braking the hood car. 4,377,442, Cl. 202-263.000.

Mayerjak, Robert J., to Currier Piano Company, Inc. Piano construction. 4,377,102, Cl. 84-184.000.

Mayfield, Charles W.; and Jenkins, Oliver J., to Youngstown Steel Door Company. Door lock. 4,377,304, Cl. 292-283.000.

Mayhew, John D., Jr. Knife gate valve. 4,377,274, Cl. 251-327.000.

McClung, Eugene F., Jr. Non slidable bottom surface for a floor covering. 4,377,610, Cl. 428-88.000.

McCollum, Bill C.; Andrews, Leonard J.; and Lempicki, Alexander, to GTE Laboratories Incorporated. Chromium (III) ordered perovskite lasers and media therefor. 4,377,864, Cl. 372-41.000.

McDaniel, Milton W.: *See—*
Elliott, Guy R. B.; Vanderborgh, Nicholas E.; and McDaniel, Milton W., 4,377,208, Cl. 166-265.000.

McDermott, Richard P.; and Brown, Ernest J., to W-F Industries, Inc. Female dies and method of manufacture. 4,377,085, Cl. 72-359.000.

McGill, Kenneth E.: *See—*
Achorn, Frank P.; and McGill, Kenneth E., 4,377,406, Cl. 71-36.000.

McHugh, William T.: *See—*
Barnes, John E.; Goebel, Franz; and McHugh, William T., 4,377,033, Cl. 29-623.500.

McKay, Dwight L.: *See—*
Bertus, Brent J.; and McKay, Dwight L., 4,377,494, Cl. 252-411.00R.
Roberts, John S.; McKay, Dwight L.; and Bertus, Brent J., 4,377,504, Cl. 252-455.00Z.

McLandrich, Matthew N., to United States of America, Navy. Method of fabricating a fused single-mode fiber bidirectional coupler. 4,377,403, Cl. 65-3.110.

McLaughlin, William L.: *See—*
Kronenberg, Stanley; Levine, Harry; McLaughlin, William L.; and Siebentritt, Carl R., 4,377,751, Cl. 250-474.100.

McMillin, John R.; and Strandwitz, Peter, to Cornelius Company, The. Apparatus for dispensing a carbonated beverage. 4,377,246, Cl. 222-56.000.

McNamara, David A., to Ford Motor Company. Method for calibrating a transducer for converting pressure variation to frequency variation. 4,377,851, Cl. 364-571.000.

McPherson, Bruce M. Closure latch mechanism improvements. 4,377,303, Cl. 292-152.000.

Mead Johnson & Company: *See—*
Larsen, Aubrey A.; and Owens, Donald A., 4,377,583, Cl. 424-251.000.

Meckler, Milton. Prismatic tracking insolation. 4,377,154, Cl. 126-425.000.

Medical I-D, Inc.: *See—*
Adams, William E., Jr.; and Carroll, James J., 4,377,047, Cl. 40-21.00C.

Mehrotra, Gopi N.: *See*—
Christopher, Todd J.; and Mehrotra, Gopi N., 4,377,788, Cl. 330-136.000.
Meinke, Herman E. Device for bundling firewood. 4,377,362, Cl. 414-43.000.
Melancon, Bernard R.: *See*—
DeCarlo, Joseph P.; and Melancon, Bernard R., 4,377,091, Cl. 73-861.870.
Melby, Earl G.: *See*—
Sponseller, David R.; Melby, Earl G.; and Fabris, Hubert J., 4,377,680, Cl. 528-123.000.
Melling, Elmer M.: *See*—
Johnson, Robert M.; and Melling, Elmer M., 4,377,415, Cl. 106-90.000.
Mellor, John M.: *See*—
Bewick, Alan; Mellor, John M.; and Pons, Bobby S., 4,377,453, Cl. 204-78.000.
Membrain Limited: *See*—
Metcalf, Eric; Woollven, Jack; Spens, Stephen N.; and Kett, Brian L. A., 4,377,782, Cl. 324-52.000.
Memorex Corporation: *See*—
Rose, Andrew M., 4,377,827, Cl. 360-78.000.
Menault, Jacques; and Rodier, Henry, to Rhone-Poulenc-Textile. Cellulose-polyacrylonitrile-DMSO-formaldehyde solutions, articles, and methods of making same. 4,377,648, Cl. 524-35.000.
Mengshoel, Hans C. Supporting device for use in a kneeling-like sitting posture. 4,377,309, Cl. 297-423.000.
Mercier, Bernard J.: *See*—
Elms, Robert T.; Saletta, Gary F.; and Mercier, Bernard J., 4,377,836, Cl. 361-96.000.
Merck & Co., Inc.: *See*—
Cragoe, Edward J., Jr.; Rooney, Clarence S.; and Williams, Haydn W. R., 4,377,588, Cl. 424-270.000.
Durette, Philippe L.; and Shen, Tsung-Ying, 4,377,570, Cl. 424-88.000.
Kang, Kenneth S.; and Veeder, George T., 4,377,636, Cl. 435-101.000.
Rasmusson, Gary H.; Johnston, David B. R.; and Arth, Glen E., deceased, 4,377,584, Cl. 424-258.000.
Veber, Daniel F.; and Freidinger, Roger M., 4,377,515, Cl. 260-112.5LH.
Merck Sharp & Dohme (I.A.) Corp.: *See*—
Chopra, Sham K., 4,377,568, Cl. 424-31.000.
Cragoe, Edward J., Jr.; Rooney, Clarence S.; and Williams, Haydn W. R., 4,377,588, Cl. 424-270.000.
Merten, Rudolf: *See*—
Giesecke, Henning; Merten, Rudolf; and Rottmaier, Ludwig, 4,377,694, Cl. 548-264.000.
Merz, Ekkehard; and Singer, Robert, to Wacker-Chemie GmbH. Laminating and coating adhesive, its manufacture and use. 4,377,433, Cl. 156-326.000.
Messrs. Cullman Handelsgesellschaft fuer Verbrauchsgueter m.b.H.: *See*—
Sellner, Kurt, 4,377,269, Cl. 248-188.600.
Metallgesellschaft AG: *See*—
Krauss, Reinhard; Maass, Horst-Dieter; and Brauer, Hans-Werner, 4,377,396, Cl. 55-59.000.
Metcalf, Eric; Woollven, Jack; Spens, Stephen N.; and Kett, Brian L. A., to Membrain Limited. Fault location methods and apparatus using current pulse injection. 4,377,782, Cl. 324-52.000.
Meyers, John S., to Boettger, Christopher. Teaching apparatus with system for repetitive review of information. 4,377,383, Cl. 434-348.000.
Mifune, Hiroyuki; Takada, Shunji; Akimura, Yoshitaka; and Fuseya, Yoshiharu, to Fuji Photo Film Co., Ltd. Method for forming high contrast photographic image. 4,377,634, Cl. 430-440.000.
Mifune, Hiroyuki; Inoue, Nobuaki; and Fuseya, Yoshiharu, to Fuji Photo Film Co., Ltd. Photographic light-sensitive material. 4,377,635, Cl. 430-564.000.
Miller Brewing Company: *See*—
Dreese, Patrick C.; and Hoseney, R. Carl, 4,377,601, Cl. 426-472.000.
Minamida, Katsuhiro; and Yamaguchi, Shigehiro, to Nippon Steel Corporation. Laser working treatment process capable of controlling the form of heated portion of a steel material. 4,377,735, Cl. 219-121.0LM.
Minato, Osamu: *See*—
Sakai, Yoshio; Masuhara, Toshiaki; Minato, Osamu; Sasaki, Toshio; Katto, Hisao; Hashimoto, Norikazu; Muramatsu, Shin-ichi; and Tomozawa, Akihiro, 4,377,819, Cl. 357-59.000.
Minnesota Mining and Manufacturing Company: *See*—
Carim, Hatim M., 4,377,170, Cl. 128-639.000.
Erickson, Edward H., 4,377,579, Cl. 424-250.000.
Hansen, Paul E., 4,377,159, Cl. 128-155.000.
Hervig, Harold C., 4,377,547, Cl. 264-262.000.
Patterson, Richard A., 4,377,363, Cl. 414-93.000.
Minolta Camera Kabushiki Kaisha: *See*—
Hosomizu, Hiroshi, 4,377,774, Cl. 315-241.00P.
Mir, Jose M., to Eastman Kodak Company. High resolution optical-addressing device and electronic scanner and/or printer apparatus employing such device. 4,377,753, Cl. 250-578.000.
Misawa, Junzi; Wakuri, Shinjiro; and Anan, Kuniyoshi, to Nippon Steel Corporation. Blast furnace having a cooling device. 4,377,277, Cl. 266-80.000.
Mislin, Roland; Uehlinger, Hanspeter; and Oppliger, Max, to Sandoz Ltd. 2-(C_{1-4}Alkoxy)carbonylamino-4-(2'-C_{1-4}alkoxy-4'-halo-1',3',5'-triazinyl-6'-amino)phenylazonaphthalenedisulfonic acids. 4,377,517, Cl. 260-153.000.
Mitani, Tateki; and Demizu, Akira, to Mitsubishi Denki Kabushiki Kaisha. Glow plug control system for diesel engine. 4,377,138, Cl. 123-179.00H.
Mitchell, Richard L.: *See*—
Cluett, Ronald D.; and Mitchell, Richard L., 4,377,540, Cl. 264-23.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Mashiko, Yoji; Takano, Hirozo; Abe, Haruhiko; Asai, Sotoju; Mizuguchi, Kazuo; and Nomoto, Sumio, 4,377,734, Cl. 219-121.0PE.
Mitani, Tateki; and Demizu, Akira, 4,377,138, Cl. 123-179.00H.
Takami, Toshiji; Ito, Toshio; and Kawaguchi, Fusako, 4,377,265, Cl. 244-153.00R.
Tsuchihashi, Michihiro; Suzuki, Ryo; Watanabe, Keiji; and Saito, Masato, 4,377,772, Cl. 315-63.000.
Yoshihara, Tsutomu; Shimotori, Kazuhiro; and Nagayama, Yasuji, 4,377,756, Cl. 307-296.00R.
Mitsuteru Tomoda: *See*—
Morinaga, Mitsuhiro, 4,377,600, Cl. 426-424.000.
Miura, Kazuhiko: *See*—
Ueno, Yoshiki; Kawabata, Takakazu; Hattori, Tadashi; and Miura, Kazuhiko, 4,377,785, Cl. 324-378.000.
Miyamoto, Tomohisa: *See*—
Yasui, Bompei; Miyamoto, Tomohisa; Hiraoka, Katsuyuki; and Sako, Yoshitaka, 4,377,691, Cl. 546-185.000.
Miyashita, Kiyoshi; Takizawa, Tatuo; Sugawa, Kazuo; and Nishikawa, Masaji, to Olympus Optical Company Ltd. Apparatus for conveying copy sheet for electrophotographic copying machine. 4,377,229, Cl. 198-494.000.
Mizuguchi, Kazuo: *See*—
Mashiko, Yoji; Takano, Hirozo; Abe, Haruhiko; Asai, Sotoju; Mizuguchi, Kazuo; and Nomoto, Sumio, 4,377,734, Cl. 219-121.0PE.
Mizuoka, Seishi: *See*—
Hanmyo, Masayuki; Ishikawa, Masaru; and Mizuoka, Seishi, 4,377,347, Cl. 374-139.000.
Mobil Oil Corporation: *See*—
Ashcraft, Charles R.; and Park, Hee C., 4,377,616, Cl. 428-213.000.
Chester, Arthur W.; and Murray, James G., 4,377,497, Cl. 252-430.000.
Chester, Arthur W.; and Chu, Yung-Feng, 4,377,721, Cl. 585-722.000.
Dessau, Ralph M., 4,377,503, Cl. 252-455.00Z.
La Pierre, Rene B.; and Gorring, Robert L., 4,377,468, Cl. 208-111.000.
LaVanture, Mark D.; and Walker, George L., 4,377,561, Cl. 423-321.00R.
Shihabi, David S., 4,377,469, Cl. 208-111.000.
Mocenter, Michael E.; and Koper, Harry F., to United States of America, Navy. Remote lens focusing system for an aerial camera. 4,377,744, Cl. 250-231.0SE.
Modine Manufacturing Company: *See*—
Saperstein, Zalman P., 4,377,024, Cl. 29-157.30C.
Mohn, Hans-Werner: *See*—
Zodrow, Rudolf; and Mohn, Hans-Werner, 4,377,432, Cl. 156-215.000.
Molins Limited: *See*—
Bolt, Reginald C.; and Dowding, John G., 4,377,743, Cl. 250-223.00R.
Momosaki, Eishi: *See*—
Kogure, Shigeru; Momosaki, Eishi; and Inoue, Minoru, 4,377,765, Cl. 310-312.000.
Monsanto Company: *See*—
Deex, Oliver D., 4,377,681, Cl. 528-193.000.
Guelpa, Egidio, 4,377,263, Cl. 242-18.100.
Howe, Robert K.; and Lee, Len F., 4,377,054, Cl. 47-57.600.
Howe, Robert K.; and Lee, Len F., 4,377,693, Cl. 548-202.000.
Morris, Donald E., 4,377,708, Cl. 560-266.000.
Serlin, Irving; and Gardner, Donald M., 4,377,612, Cl. 428-212.000.
Serlin, Irving; and Gardner, Donald M., 4,377,656, Cl. 524-413.000.
Monson, Daryl J., to United States of America, National Aeronautics and Space Administration. Dual-beam skin friction interferometer. 4,377,343, Cl. 356-357.000.
Monte, Anthony J. Fuel truck fire escape mechanism. 4,377,210, Cl. 169-62.000.
Montgomery, Gary V., to Sunbeam Plastics Corporation. Child-resistant package with tilting closure. 4,377,236, Cl. 206-540.000.
Moon, William G.: *See*—
Carr, Norman L.; Moon, William G.; and Prudich, Michael E., 4,377,464, Cl. 208-8.0LE.
Mooney, David H., Jr.; and Harriger, Keith A., to Westinghouse Electric Corp. Medium PRF pulse doppler radar having simplified ground moving target rejection capabilities. 4,377,811, Cl. 343-7.00A.
Moore, Royal C., Jr.: *See*—
Hayman, Charles L.; Roes, John B.; and Moore, Royal C., Jr., 4,377,828, Cl. 360-88.000.
Moore, William H. Addition agent for cast iron. 4,377,411, Cl. 420-578.000.
Moraw, Klaus: *See*—
Giebeler, Eberhard; Bluhm, Bernhard; Alscher, Arnold; Moraw, Klaus; Collin, Gerd; and Nilles, Heinzpeter, 4,377,040, Cl. 34-16.500.

Moreau, Robert D.: *See*—
Haas, Howard C.; and Moreau, Robert D., 4,377,654, Cl. 524-236.000.
Morinaga, Mitsuhiro, to Mitsuteru Tomoda. Method for producing deodorized liquid garlic extract. 4,377,600, Cl. 426-424.000.
Morishita, Hajime; Kohashi, Takahiro; Nonogaki, Saburo; Akagi, Motoo; Hayashi, Nobuaki; and Uchino, Shoichi, to Hitachi, Ltd. Photosensitive composition. 4,377,630, Cl. 430-176.000.
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Moriya, Takahiko; Hazuki, Yoshikazu; and Kashiwagi, Masahiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for producing semiconductor device. 4,377,438, Cl. 156-643.000.
Morris, Donald E., to Monsanto Company. Hydrocarboxylation of vinyl alkanoates. 4,377,708, Cl. 560-266.000.
Morton, Arthur W., to Conoco Inc. Flow line bundle and method of towing same. 4,377,354, Cl. 405-171.000.
Moser, Paul, to Ciba-Geigy Corporation. Hindered piperidine ligands. 4,377,690, Cl. 546-19.000.
Motorola Inc.: *See*—
Bennett, Charles E., 4,377,398, Cl. 55-208.000.
Borras, Jaime A.; and Gonzalez, Ruben J., 4,377,871, Cl. 455-76.000.
Gay, Michael J.; and Pace, W. David, 4,377,730, Cl. 179-170.0NC.
Hilbert, Francis H., 4,377,728, Cl. 179-1.0GS.
Janc, Robert V.; Robins, David S.; and Retzer, Michael H., 4,377,866, Cl. 375-94.000.
Toney, John J.; and Brown, Leland T., 4,377,832, Cl. 361-56.000.
Welling, John R.; and Mattox, Donald L., 4,377,198, Cl. 165-32.000.
Zobel, Don W.; and Pace, W. David, 4,377,790, Cl. 331-111.000.
Moulinex, SA: *See*—
Aurensan, Jean-Claude A., 4,377,045, Cl. 38-11.000.
Mouri, Yasunori: *See*—
Amano, Matsuo; Sugawara, Toru; Mouri, Yasunori; Aochi, Yoshikazu; and Sakamoto, Shinichi, 4,377,137, Cl. 123-179.00B.
Mowbray, Dorian F.: *See*—
Jarrett, Boaz A.; Fenne, Ivor; Mowbray, Dorian F.; and Mardell, John E., 4,377,139, Cl. 123-358.000.
Mozolev, Alexandr V.: *See*—
Gubin, Ivan P.; Machavariani, Sergei G.; Efremovtsev, Nikolai S.; Kovalenko, Viktor A.; Mozolev, Alexandr V.; Nikolaev, Sergei I.; Nikolaev, Georgy I.; Guriyanov, Viktor A.; Temnikov, Anatoly I.; Tyryshkin, Evgeny E.; Dubynin, Nikolai G.; Kogan, Volf Z.; Ljubkin, Anatoly P.; and Sedko, Anatoly P., 4,377,310, Cl. 299-13.000.
Mucha, Joachim: *See*—
Konemann, Bernd; Mucha, Joachim; and Zwiehoff, Gunther, 4,377,757, Cl. 307-303.000.
Mueller, Franz, to Siemens Aktiengesellschaft. Tomograph for the production of transverse layer images. 4,377,868, Cl. 378-019.000.
Muenger, James R.; Child, Edward T.; and Brent, Albert, to Texaco Development Corporation. Apparatus for the production of cleaned and cooled synthesis gas. 4,377,394, Cl. 48-62.00R.
Muerki, Helmut, to Siemens Aktiengesellschaft. Method and a device for cutting a plurality of light waveguides united in a cable. 4,377,250, Cl. 225-2.000.
Mukaida, Yutaka: *See*—
Takita, Hitoshi; Mukaida, Yutaka; Noda, Sakuo; and Kobayashi, Hidetoshi, 4,377,594, Cl. 424-309.000.
Muller, Klaus: *See*—
Linder, Ernst; Muller, Klaus; and Maurer, Helmut, 4,377,086, Cl. 73-35.000.
Muller, Werner H., to Hoechst Aktiengesellschaft. Process for the manufacture of 5-oxoalkanoic acids. 4,377,709, Cl. 562-459.000.
Munters Corporation, The: *See*—
Dunkers, Karl R., 4,377,477, Cl. 210-170.000.
Muraji, Takashi; and Kitamura, Hiroshi, to SMK Industries. Method and apparatus for applying permanent wave. 4,377,174, Cl. 132-9.000.
Murakami, Keinosuke: *See*—
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Murakami, Noboru; Hasegawa, Hiromi; and Iwase, Yoshinobu, to Aisin Seiki Kabushiki Kaisha. Speed change gear system. 4,377,095, Cl. 74-759.000.
Murakami, Yasushi: *See*—
Shirakawa, Norio; Tomioka, Hiromi; Koizumi, Masuo; Takeuchi, Masaki; Sugiyama, Hiroshi; Okada, Masanori; Yoshimoto, Masahiro; Iwane, Yoshitaka; and Murakami, Yasushi, 4,377,407, Cl. 71-76.000.
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Sakai, Yoshio; Masuhara, Toshiaki; Minato, Osamu; Sasaki, Toshio; Katto, Hisao; Hashimoto, Norikazu; Muramatsu, Shin-ichi; and Tomozawa, Akihiro, 4,377,819, Cl. 357-59.000.
Murata Kikai Kabushiki Kaisha: *See*—
Yanobu, Hideo, 4,377,065, Cl. 57-279.000.
Murphy, Jack P., deceased: *See*—
Kimmell, Steven D.; and Murphy, Jack P., deceased, 4,377,441, Cl. 202-153.000.
Murphy, James P., administrator: *See*—
Kimmell, Steven D.; and Murphy, Jack P., deceased, 4,377,441, Cl. 202-153.000.
Murphy, Thomas V. Modular merchandise display tower. 4,377,231, Cl. 206-44.00R.
Murray, James G.: *See*—
Chester, Arthur W.; and Murray, James G., 4,377,497, Cl. 252-430.000.
Mycynek, Victor G., to Zenith Radio Corporation. Noise processing system for a television receiver. 4,377,823, Cl. 358-157.000.
Myers, Robert F., to Pfizer Inc. Derivatives of ampicillin and amoxicillin with beta-lactamase inhibitors. 4,377,590, Cl. 424-271.000.
Nagaishi, Hatsuo, to Nissan Motor Co., Ltd. Intake vacuum sensing system with correction device for an internal combustion engine. 4,377,145, Cl. 123-494.000.
Nagano, Masanobu: *See*—
Ueda, Ikuo; Kato, Masayuki; and Nagano, Masanobu, 4,377,580, Cl. 424-251.000.
Nagayama, Yasuji: *See*—
Yoshihara, Tsutomu; Shimotori, Kazuhiro; and Nagayama, Yasuji, 4,377,756, Cl. 307-296.00R.
Nagoya, Mitsuru: *See*—
Yamada, Shinji; and Nagoya, Mitsuru, 4,377,345, Cl. 368-245.000.
Nair, Kumaran M., to Du Pont de Nemours, E. I., and Company. Screen-printable dielectric composition. 4,377,840, Cl. 361-320.000.
Nakagawa, Kazuhiro: *See*—
Shiraishi, Yoshihisa; Nakagawa, Kazuhiro; Nakata, Chiaki; and Ohasi, Koiti, 4,377,490, Cl. 252-188.30R.
Nakahara, Keisuke: *See*—
Yamashita, Kasane; Ikehata, Takao; Tate, Kazuhiko; and Nakahara, Keisuke, 4,377,483, Cl. 210-670.000.
Nakamura, Nobunosuke; and Kimoto, Hisanori, to Fuji Kosan Kabushiki Kaisha; and Seiwa Ltd. Rotary heat exchange apparatus provided with a spherically coiled heat transfer tube. 4,377,202, Cl. 165-86.000.
Nakano, Takashi: *See*—
Tsuji, Takao; Ichikawa, Junji; Ichihashi, Hiroo; Sugiura, Yoshinori; Nakano, Takashi; and Hirayama, Kazuhiro, 4,377,333, Cl. 355-3.0SH.
Nakata, Chiaki: *See*—
Shiraishi, Yoshihisa; Nakagawa, Kazuhiro; Nakata, Chiaki; and Ohasi, Koiti, 4,377,490, Cl. 252-188.30R.
Nalco Chemical Company: *See*—
Sadowski, Anthony J., 4,377,118, Cl. 110-343.000.
Seale, Virgil L.; Stanford, James R.; Briscoe, James E.; and Penny, Glenn S., 4,377,710, Cl. 564-281.000.
Nannette Manufacturing Company, Inc.: *See*—
Sudjian, Mary, 4,377,007, Cl. 2-105.000.
Napco, Inc.: *See*—
Lovejoy, Curtis N., 4,377,461, Cl. 204-198.000.
Narasaka, Shin: *See*—
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, 4,377,142, Cl. 123-440.000.
Nardone, John M., to Bush Universal, Inc. Sole press pad box. 4,377,012, Cl. 12-16.400.
Nasrallah, Elias T. Method of chelating heavy metal ions. 4,377,484, Cl. 210-698.000.
Natarajan, Sesha I.; and Ondetti, Miguel A., to E. R. Squibb & Sons, Inc. 4-Methylene-1-[[(alranoyl or arylcarbonyl)mercapto]acyl]proline and pipecolic acid. 4,377,701, Cl. 548-533.000.
National Distillers & Chemical Corp.: *See*—
Fischer, Joseph, 4,377,650, Cl. 524-88.000.
National Gypsum Company: *See*—
Johnson, Robert M.; and Melling, Elmer M., 4,377,415, Cl. 106-90.000.
National Institute for Researches in Inorganic Materials: *See*—
Setaka, Nobuo, 4,377,565, Cl. 423-446.000.
National Research Development Corporation: *See*—
Albery, Wyndham J., 4,377,446, Cl. 204-1.00T.
Bewick, Alan; Mellor, John M.; and Pons, Bobby S., 4,377,453, Cl. 204-78.000.
National Semiconductor Corporation: *See*—
Lavi, Yoav, 4,377,855, Cl. 365-49.000.
Naylor, Jimmy C.; and Norton, Richard G., to Deere & Company. Fuel temperature control system. 4,377,149, Cl. 123-557.000.
Neathery, David: *See*—
Kincheloe, David; and Neathery, David, 4,377,111, Cl. 101-44.000.
Neathery, David O.: *See*—
Kincheloe, David W.; and Neathery, David O., 4,377,251, Cl. 226-195.000.
Neki, Shigeo; Shinozaki, Nozomu; and Dohi, Takashi, to Matsushita Electric Industrial Company, Limited. Sewing machine speed control system having quick response characteristic. 4,377,778, Cl. 318-341.000.
Nelson, Richard D.: *See*—
Smith, Bernard T.; Armstrong, Wayne T.; and Nelson, Richard D., 4,377,747, Cl. 250-370.000.
Netzel, James P., to John Crane-Houdaille, Inc. Symmetrical seal package for multiple face seals. 4,377,290, Cl. 277-38.000.
New England Nuclear Corporation: *See*—
Russo, Michael S., 4,377,075, Cl. 62-372.000.
New Mexico State University Foundation, Inc.: *See*—
Zartman, David L., 4,377,157, Cl. 128-1.00R.
NHK Spring Co., Ltd.: *See*—
Takahashi, Jun, 4,377,019, Cl. 16-307.000.
Niemann, Helmut: *See*—
Bardenhagen, Dietrich; Hausler, Nikolaus; Niemann, Helmut; Greve, Heinz; and Schluer, Karl-Heinz, 4,377,098, Cl. 83-310.000.
Niermeijer, Anton G. A., to Vredestein N.V. Footmat. 4,377,016, Cl. 15-215.000.

Nikolaev, Georgy I.: *See*—
Gubin, Ivan P.; Machavariani, Sergei G.; Efremovtsev, Nikolai S.; Kovalenko, Viktor A.; Mozolev, Alexandr V.; Nikolaev, Sergei I.; Nikolaev, Georgy I.; Guriyanov, Viktor A.; Temnikov, Anatoly I.; Tyryshkin, Evgeny E.; Dubynin, Nikolai G.; Kogan, Volf Z.; Ljubkin, Anatoly P.; and Sedko, Anatoly P., 4,377,310, Cl. 299-13.000.

Nikolaev, Sergei I.: *See*—
Gubin, Ivan P.; Machavariani, Sergei G.; Efremovtsev, Nikolai S.; Kovalenko, Viktor A.; Mozolev, Alexandr V.; Nikolaev, Sergei I.; Nikolaev, Georgy I.; Guriyanov, Viktor A.; Temnikov, Anatoly I.; Tyryshkin, Evgeny E.; Dubynin, Nikolai G.; Kogan, Volf Z.; Ljubkin, Anatoly P.; and Sedko, Anatoly P., 4,377,310, Cl. 299-13.000.

Nilles, Heinzpeter: *See*—
Giebeler, Eberhard; Bluhm, Bernhard; Alscher, Arnold; Moraw, Klaus; Collin, Gerd; and Nilles, Heinzpeter, 4,377,040, Cl. 34-16.500.

Nippon Chemiphar Co., Ltd.: *See*—
Fujimoto, Yasuo; and Yamabe, Shigeru, 4,377,702, Cl. 549-12.000.

Nippon Crucible Company, Ltd.: *See*—
Nomura, Mitsuo; Amano, Shigeru; Okubo, Sho; Hosaka, Takuo; Shiraishi, Kunihiko; and Adachi, Ryuzi, 4,377,413, Cl. 106-76.000.

Nippon Hoso Kyokai (The Japan Broadcasting Corporation): *See*—
Kikuoka, Takao; Yamamoto, Hiroaki; Sasaki, Noriyoshi; Wakui, Kotaro; Murakami, Keinosuke; Ohnishi, Kazunori; Kawamura, Gou; Noguchi, Hiroshi; and Ukigaya, Fumio, 4,377,787, Cl. 324-431.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Hanmyo, Masayuki; Ishikawa, Masaru; and Mizuoka, Seishi, 4,377,347, Cl. 374-139.000.
Yamashita, Kasane; Ikehata, Takao; Tate, Kazuhiko; and Nakahara, Keisuke, 4,377,483, Cl. 210-670.000.

Nippon Seisen Co., Ltd.: *See*—
Ishibe, Hideomi, 4,377,409, Cl. 75-0.50R.

Nippon Soken, Inc.: *See*—
Okamoto, Kunio; and Fukami, Akira, 4,377,400, Cl. 55-269.000.
Ueno, Yoshiki; Kawabata, Takakazu; Hattori, Tadashi; and Miura, Kazuhiko, 4,377,785, Cl. 324-378.000.

Nippon Steel Corporation: *See*—
Kohyama, Fuzimasa; Inoue, Yasusuke; and Akase, Sigeyuki, 4,377,302, Cl. 285-334.000.
Minamida, Katsuhiro; and Yamaguchi, Shigehiro, 4,377,735, Cl. 219-121.0LM.
Misawa, Junzi; Wakuri, Shinjiro; and Anan, Kuniyoshi, 4,377,277, Cl. 266-80.000.
Nomura, Mitsuo; Amano, Shigeru; Okubo, Sho; Hosaka, Takuo; Shiraishi, Kunihiko; and Adachi, Ryuzi, 4,377,413, Cl. 106-76.000.

Nippon Suisan Kaisha, Ltd.: *See*—
Fujita, Takao; and Makuta, Masahiro, 4,377,526, Cl. 260-424.000.

Nippondenso Co., Ltd.: *See*—
Uga, Kozo, 4,377,740, Cl. 377-2.000.

Nishikawa, Masaji, to Olympus Optical Company Ltd. Magnet roll developing unit. 4,377,334, Cl. 355-3.0DD.

Nishikawa, Masaji: *See*—
Miyashita, Kiyoshi; Takizawa, Tatuo; Sugawa, Kazuo; and Nishikawa, Masaji, 4,377,229, Cl. 198-494.000.

Nishikawa, Masao; Aoki, Takashi; and Sato, Yoichi, to Honda Giken Kogyo Kabushiki Kaisha. Power steering system having hydraulic reaction chambers. 4,377,217, Cl. 180-143.000.

Nishimura, Toshiyuki: *See*—
Makino, Kenya; Sakurai, Hideo; Watanabe, Masaru; and Nishimura, Toshiyuki, 4,377,671, Cl. 526-124.000.

Nishino, Atsushi: *See*—
Ikeda, Masaki; Nishino, Atsushi; and Suzuki, Tadashi, 4,377,618, Cl. 428-323.000.

Nishiuma, Saburo: *See*—
Tonomura, Toshiya; and Nishiuma, Saburo, 4,377,155, Cl. 126-443.000.

Nishizawa, Jun-ichi; and Ohmi, Tadahiro, to Semiconductor Research Foundation. Semiconductor image sensors. 4,377,817, Cl. 357-22.000.

Nissan Motor Co., Ltd.: *See*—
Fujii, Masayuki, 4,377,299, Cl. 280-708.000.
Fukuma, Daizo; Suzuki, Shigeru; Shirota, Kensho; and Harada, Kunihiro, 4,377,678, Cl. 528-75.000.
Fukushima, Masao, 4,377,218, Cl. 180-300.000.
Izumi, Masao, 4,377,107, Cl. 98-40.00V.
Kitamura, Hidetoshi; and Oyama, Takeo, 4,377,150, Cl. 123-588.000.
Nagaishi, Hatsuo, 4,377,145, Cl. 123-494.000.
Senoo, Tetsuo, 4,377,293, Cl. 280-6.00R.
Ueno, Kenzo, 4,377,216, Cl. 180-73.0TL.

Noack, Rolf, to Deutsche Babcock Aktiengesellschaft. Method for burning materials having components that are difficult to burn out, and apparatus for carrying out the same. 4,377,119, Cl. 110-346.000.

Noda, Sakuo: *See*—
Takita, Hitoshi; Mukaida, Yutaka; Noda, Sakuo; and Kobayashi, Hidetoshi, 4,377,594, Cl. 424-309.000.

Nogami, Saburo: *See*—
Inui, Takayasu; Ootsuka, Kazuo; Nogami, Saburo; Igarashi, Michiaki; Horikoshi, Toshiaki; and Izumi, Kazuhiro, 4,377,043, Cl. 37-18.00R.

Noguchi, Hiroshi: *See*—
Kikuoka, Takao; Yamamoto, Hiroaki; Sasaki, Noriyoshi; Wakui, Kotaro; Murakami, Keinosuke; Ohnishi, Kazunori; Kawamura, Gou; Noguchi, Hiroshi; and Ukigaya, Fumio, 4,377,787, Cl. 324-431.000.

Noirel, Yves M.; Blineau, Joseph; Leray, Pierre; and Bauduin, Jean-Pierre, to L'Etat Francais, Represente par le Secre-d-Etat aux Postes et Telecommunications; and A la Telediffusion Centre National. Test equipment for a teletex television receiver. 4,377,822, Cl. 358-139.000.

Noirot, Daniel: *See*—
Bartoli, Michel; Bernard, Armand R.; and Noirot, Daniel, 4,377,609, Cl. 428-71.000.

Nomoto, Sumio: *See*—
Mashiko, Yoji; Takano, Hirozo; Abe, Haruhiko; Asai, Sotoju; Mizuguchi, Kazuo; and Nomoto, Sumio, 4,377,734, Cl. 219-121.0PE.

Nomura, Mitsuo; Amano, Shigeru; Okubo, Sho; Hosaka, Takuo; Shiraishi, Kunihiko; and Adachi, Ryuzi, to Nippon Steel Corporation; and Nippon Crucible Company, Ltd. Refractory composition for flow casting. 4,377,413, Cl. 106-76.000.

Nonogaki, Saburo: *See*—
Morishita, Hajime; Kohashi, Takahiro; Nonogaki, Saburo; Akagi, Motoo; Hayashi, Nobuaki; and Uchino, Shoichi, 4,377,630, Cl. 430-176.000.

Nordstjernan AB: *See*—
Conrad, Ernst, 4,377,602, Cl. 426-656.000.

Noren, Torsten: *See*—
Hoberstorfer, Gustav; and Noren, Torsten, 4,377,353, Cl. 405-130.000.

North American Philips Consumer Electronics Corp.: *See*—
Gallaro, Anthony V.; and Hedler, Robert A., 4,377,768, Cl. 313-467.000.

Northwestern University: *See*—
Goldberg, Erwin, 4,377,516, Cl. 260-112.50R.

Norton, Richard G.: *See*—
Naylor, Jimmy C.; and Norton, Richard G., 4,377,149, Cl. 123-557.000.

Novatome: *See*—
Doublet, Philippe; and Jullien, Georges, 4,377,552, Cl. 376-405.000.

Nugent, Frank J., to General Foods Corporation. Package for protecting friable products. 4,377,598, Cl. 426-108.000.

Nummy, Laurence J.: *See*—
Trenbeath, Steven L.; Feldman, Allan M.; and Nummy, Laurence J., 4,377,530, Cl. 260-453.00P.

Nychka, Henry R.; Hino, John B.; Eibeck, Richard E.; and Robinson, Martin A., to Allied Corporation. Production of perfluoropropane. 4,377,715, Cl. 570-123.000.

Occidental Chemical Corporation: *See*—
Bommaraju, Tilak V., 4,377,454, Cl. 204-95.000.
Foster, Arthur M.; and Maul, James J., 4,377,712, Cl. 568-635.000.
Freeman, Dennis B., 4,377,487, Cl. 252-33.400.

Occidental Research Corporation: *See*—
Ore', Fernando, 4,377,560, Cl. 423-321.00R.

O'Donnell, Albert E.; and Gum, Clarence R., to Shell Oil Company. Nickel complexes in diol solvents and their use as oligomerization catalyst precursors. 4,377,499, Cl. 252-431.00K.

Ogura Clutch Co., Ltd.: *See*—
Takata, Terasu; Hangai, Makoto; and Yokoyama, Yasuo, 4,377,224, Cl. 192-18.00R.

Ohasi, Koiti: *See*—
Shiraishi, Yoshihisa; Nakagawa, Kazuhiro; Nakata, Chiaki; and Ohasi, Koiti, 4,377,490, Cl. 252-188.30R.

Ohhata, Michinobu; Matsumura, Toshihiko; Yamasawa, Masao; Chujo, Takafumi; and Takahashi, Masayuki, to Konishiroku Photo Industry Co., Ltd. Offset compensating circuit. 4,377,759, Cl. 307-491.000.

Ohline Corporation: *See*—
Tsuhako, Parker I., 4,377,194, Cl. 160-168.00R.

Ohlson, Kurt L. Holding device. 4,377,351, Cl. 403-348.000.

Ohmi, Tadahiro: *See*—
Nishizawa, Jun-ichi; and Ohmi, Tadahiro, 4,377,817, Cl. 357-22.000.

Ohmura, Kaoru; Shibasaki, Ichiro; and Kimura, Takeo, to Asahi Kasei Kogyo Kabushiki Kaisha. Polyamide-imide compositions and articles for electrical use prepared therefrom. 4,377,652, Cl. 524-104.000.

Ohnishi, Kazunori: *See*—
Kikuoka, Takao; Yamamoto, Hiroaki; Sasaki, Noriyoshi; Wakui, Kotaro; Murakami, Keinosuke; Ohnishi, Kazunori; Kawamura, Gou; Noguchi, Hiroshi; and Ukigaya, Fumio, 4,377,787, Cl. 324-431.000.

Oil Mop (UK) Limited: *See*—
Rolls, George H.; Beveridge, Andrew J.; Challener, Ronald T.; and Stuart, William, 4,377,478, Cl. 210-242.300.

Okabe, Moisei: *See*—
Tatsumi, Hideo; Kanamaru, Hisanobu; Tohkairin, Akira; Okabe, Moisei; and Kasama, Ryoji, 4,377,762, Cl. 310-42.000.

Okada, Masanori: *See*—
Shirakawa, Norio; Tomioka, Hiromi; Koizumi, Masuo; Takeuchi, Masaki; Sugiyama, Hiroshi; Okada, Masanori; Yoshimoto, Masahiro; Iwane, Yoshitaka; and Murakami, Yasushi, 4,377,407, Cl. 71-76.000.

Okamoto, Kunio; and Fukami, Akira, to Nippon Soken, Inc. Heat exchanger. 4,377,400, Cl. 55-269.000.

Okerlin, John. Basketball training device. 4,377,284, Cl. 273-1.50A.

Oki Electric Industry Co., Ltd.: *See*—
Isobe, Minoru; Kikuchi, Hiroshi; Teshima, Minoru; and Kodama, Tadasi, 4,377,348, Cl. 400-124.000.

Okinaka, Yutaka, to Bell Telephone Laboratories, Incorporated. Palladium electroplating procedure. 4,377,450, Cl. 204-46.00R.

Okubo, Sho: *See*—
Nomura, Mitsuo; Amano, Shigeru; Okubo, Sho; Hosaka, Takuo; Shiraishi, Kunihiko; and Adachi, Ryuzi, 4,377,413, Cl. 106-76.000.
Old, John L., to Massey-Ferguson Services N.V. Ballast weights for tractors. 4,377,300, Cl. 280-758.000.
Olin Corporation: *See*—
Kadija, Igor V.; and Woodard, Kenneth E., Jr., 4,377,455, Cl. 204-98.000.
Oliver, Colin C., to EMI Limited. Radiography. 4,377,867, Cl. 378-19.000.
Olschewski, Armin; Hetterich, Hermann; and Horling, Peter, to SKF Kugellagerfabriken GmbH. Thin-walled bearing bushings produced in the drawing process. 4,377,313, Cl. 308-216.000.
Olson, Jan C. H.; and Carlson, Karl G., to TEX Innovation AB. Horizontal packaging apparatus. 4,377,061, Cl. 53-433.000.
Olson, Leonard T.: *See*—
Ecker, Mario E.; and Olson, Leonard T., 4,377,316, Cl. 339-17.0CF.
Olympus Optical Co., Ltd.: *See*—
Furuta, Kenji, 4,377,826, Cl. 360-72.100.
Hiroshi, Takase; and Kimura, Tadashi, 4,377,325, Cl. 350-423.000.
Kobayashi, Yuko, 4,377,326, Cl. 350-471.000.
Miyashita, Kiyoshi; Takizawa, Tatuo; Sugawa, Kazuo; and Nishikawa, Masaji, 4,377,229, Cl. 198-494.000.
Nishikawa, Masaji, 4,377,334, Cl. 355-3.0DD.
Ondetti, Miguel A.: *See*—
Natarajan, Sesha I.; and Ondetti, Miguel A., 4,377,701, Cl. 548-533.000.
Oniki, Tetsuya; and Kadowaki, Kunio, to Aisan Industry Co., Ltd. Vaporized fuel controller for a carburetor. 4,377,146, Cl. 123-520.000.
Onkyo Kabushiki Kaisha: *See*—
Ikei, Akira; Akahama, Motoharu; Wada, Tokisuke; and Onogi, Takashi, 4,377,617, Cl. 428-214.000.
Onoda Cement Company, Limited: *See*—
Itoh, Tsutomu; Furuya, Nobuo; Ouchi, Kenji; Shimizu, Takeo; and Saitoh, Hiroshi, 4,377,603, Cl. 427-25.000.
Onodera, Tamio: *See*—
Sato, Kimihiko; Sakai, Tokuji; Yamasaki, Yasuo; Onodera, Tamio; and Sumitani, Koji, 4,377,718, Cl. 585-467.000.
Onogi, Takashi: *See*—
Ikei, Akira; Akahama, Motoharu; Wada, Tokisuke; and Onogi, Takashi, 4,377,617, Cl. 428-214.000.
Ootsuka, Kazuo: *See*—
Inui, Takayasu; Ootsuka, Kazuo; Nogami, Saburo; Igarashi, Michiaki; Horikoshi, Toshiaki; and Izumi, Kazuhiro, 4,377,043, Cl. 37-18.00R.
Oppliger, Max: *See*—
Mislin, Roland; Uehlinger, Hanspeter; and Oppliger, Max, 4,377,517, Cl. 260-153.000.
Ordway, James F.: *See*—
Bailey, Edward A.; and Ordway, James F., 4,377,213, Cl. 175-211.000.
Ore', Fernando, to Occidental Research Corporation. Process for producing low aluminum content phosphoric acid from high aluminum matrix. 4,377,560, Cl. 423-321.00R.
Orth, Winfried: *See*—
Maurer, Manfred; Orth, Winfried; and Fickert, Werner, 4,377,699, Cl. 548-469.000.
Osaka City: *See*—
Hoshikawa, Takeshi; and Takinami, Iwao, 4,377,404, Cl. 65-59.220.
Oshima, Nobuyasu: *See*—
Kato, Masataka; and Oshima, Nobuyasu, 4,377,120, Cl. 112-158.00E.
Ostermann, Peter, to Hickey-Mitchell Company. Coin controlled single manual vend newspaper vendor. 4,377,228, Cl. 194-54.000.
Ostlund, Bernt: *See*—
Asplund, Gunnar; Eklund, Lars; and Ostlund, Bernt, 4,377,835, Cl. 361-91.000.
Otani, Takeshi; Watanabe, Osamu; and Sakaguchi, Masashi, to Showa Aluminum Ind. K.K.; and Showa Aluminum Corp. Cast ingot of aluminum alloy available for rolling operation and method for manufacturing the same. 4,377,425, Cl. 148-437.000.
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, to Honda Giken Kogyo Kabushiki Kaisha. Air/fuel ratio control system having an evaporated fuel purging control arrangement. 4,377,142, Cl. 123-440.000.
Otto Bock Orthopadische Industrie KG: *See*—
Horvath, Eduard, 4,377,305, Cl. 294-106.000.
Ouchi, Kenji: *See*—
Itoh, Tsutomu; Furuya, Nobuo; Ouchi, Kenji; Shimizu, Takeo; and Saitoh, Hiroshi, 4,377,603, Cl. 427-25.000.
Owens, Donald A.: *See*—
Larsen, Aubrey A.; and Owens, Donald A., 4,377,583, Cl. 424-251.000.
Owens, Donald R.: *See*—
Levey, Gustave S.; Reeves, Clarence C.; and Owens, Donald R., 4,377,838, Cl. 361-228.000.
Oxenreider, Terry; Duesterhoeft, Donald A.; and Erb, Edgar M., to General Battery Corporation. Apparatus and method for casting lead into plastic for side terminal batteries. 4,377,197, Cl. 164-112.000.
Oyama, Takeo: *See*—
Kitamura, Hidetoshi; and Oyama, Takeo, 4,377,150, Cl. 123-588.000.
Ozawa, Kaoru: *See*—
Kasubuchi, Takeshi; Hara, Takeo; and Ozawa, Kaoru, 4,377,825, Cl. 360-48.000.
Ozawa, Osamu, to Tokyo Shibaura Denki Kabushiki Kaisha. Process for fabricating a bipolar integrated circuit having capacitors. 4,377,029, Cl. 29-576.00B.
Pace, W. David: *See*—
Gay, Michael J.; and Pace, W. David, 4,377,730, Cl. 179-170.0NC.
Zobel, Don W.; and Pace, W. David, 4,377,790, Cl. 331-111.000.
Page, Donald F.: *See*—
Lesher, George Y.; and Page, Donald F., 4,377,585, Cl. 424-263.000.
Pahler, William J. Record and tape storage unit. 4,377,233, Cl. 206-310.000.
Pape, Heinz; and Quella, Ferdinand, to Siemens Aktiengesellschaft. Passive display device. 4,377,750, Cl. 250-458.100.
Park, Hee C.: *See*—
Ashcraft, Charles R.; and Park, Hee C., 4,377,616, Cl. 428-213.000.
Parker, Alan J.; Singh, Pritam; and Avraamides, James, to Anumin Pty. Ltd. Electro-chemical cells. 4,377,623, Cl. 429-15.000.
Parker, Richard G., to B. F. Goodrich Company, The. Process for chlorination of poly(vinyl chloride) with liquid chlorine, and chlorinated poly(vinyl chloride) composition. 4,377,459, Cl. 204-159.180.
Parks, Dale B.; Fannon, Ronald A.; and Kosmider, Ronald T., to Bunnington Corporation. Heated pressure rolls. 4,377,336, Cl. 355-3.0FU.
Parks, Dale B.: *See*—
Fannon, Ronald A.; and Parks, Dale B., 4,377,335, Cl. 355-3.0FU.
Parsen, Frank E.; and Rosler, Eleanor J., to Duracell Inc. Corrosion and hydrogen evolution inhibitors for current-producing cells having zinc anodes. 4,377,625, Cl. 429-198.000.
Parthuisot, Jean P.: *See*—
Chevalier, Claude; Bouvet, Jean-Marie; and Parthuisot, Jean P., 4,377,226, Cl. 192-3.300.
Paszthory, Emmerich: *See*—
Elinkmann, Hans-Gerd; and Paszthory, Emmerich, 4,377,703, Cl. 549-24.000.
Patel, Dilip C., to Magnetic Peripherals Inc. Combination magnetic disk storage device and filter system. 4,377,830, Cl. 360-98.000.
Paton, Charles R.: *See*—
Grunert, Kurt A.; Paton, Charles R.; Henwood, John J.; Dauer, John J., Jr.; and DeVault, Birch L., 4,377,796, Cl. 335-131.000.
Patschke, Hartmut: *See*—
Gobel, Arthur; Gobel, Rudolf; and Patschke, Hartmut, 4,377,812, Cl. 343-872.000.
Patterson, Richard A., to Minnesota Mining and Manufacturing Company. Stacking mechanism. 4,377,363, Cl. 414-93.000.
Patty, Blyde L. Closure for container. 4,377,245, Cl. 220-336.000.
Paul, James A.: *See*—
Paul, William A.; and Paul, James A., 4,377,786, Cl. 324-426.000.
Paul, William A.; and Paul, James A., to Radco Industries, Inc. Battery testing apparatus. 4,377,786, Cl. 324-426.000.
Pawlowski, Thomas D., to James River-Dixie/Northern, Inc. Multiple compartment carton. 4,377,237, Cl. 206-630.000.
Paygro, Inc.: *See*—
Kipp, Carl E., Jr., 4,377,258, Cl. 241-27.000.
Payne, Edward H.: *See*—
Abrahamovich, Karen M.; Hamel, Clifford J.; Payne, Edward H.; and Weed, Dean R., 4,377,633, Cl. 430-312.000.
Peck, Bernard J.: *See*—
Shapiro, Jay H.; and Peck, Bernard J., 4,377,597, Cl. 426-92.000.
Peck Meat Packing Corporation: *See*—
Shapiro, Jay H.; and Peck, Bernard J., 4,377,597, Cl. 426-92.000.
Penny, Glenn S.: *See*—
Seale, Virgil L.; Stanford, James R.; Briscoe, James E.; and Penny, Glenn S., 4,377,710, Cl. 564-281.000.
PepsiCo Inc.: *See*—
Simon, Donald R.; and Strowe, Robert J., 4,377,049, Cl. 40-465.000.
Pesa, Frederick A.; and Graham, Anne M., to Standard Oil Company, The. Upgrading synthesis gas. 4,377,643, Cl. 518-713.000.
Peters, Franz, to Hergeth KG Maschinenfabrik und Apparatebau. Apparatus for opening and mixing fibrous material, e.g. cotton. 4,377,021, Cl. 19-80.00R.
Peterschinegg, Hans: *See*—
Fuld, Stephan; and Peterschinegg, Hans, 4,377,800, Cl. 338-2.000.
Peterson, Donald L., to United States of America, Agriculture. Rod press fruit harvester. 4,377,064, Cl. 56-328.00R.
Peterson, Francis C., to Illinois Tool Works Inc. Quarter-turn nut. 4,377,359, Cl. 411-112.000.
Peterson, Ronald E.: *See*—
Durand, William W.; Jain, Anil K.; and Peterson, Ronald E., 4,377,324, Cl. 350-166.000.
Petrellis, Nicolas C.: *See*—
Sabol, Albert R.; and Petrellis, Nicolas C., 4,377,527, Cl. 260-429.900.
Petrov, Rem V.: *See*—
Lopukhin, Jury M.; Petrov, Rem V.; Arion, Vitaly Y.; Breusov, Jury N.; Gladysheva, Tatyana V.; Sanina, Irina V.; Lebedev, Vasily V.; Kirzon, Serafima S.; and Ivanushkin, Evgeny F., 4,377,511, Cl. 260-112.00R.
Pettenpaul, Ewald; Huber, Jakob; and Weidlich, Herbert, to Siemens Aktiengesellschaft. Metallization of selectively implanted A_{III}-B_V compound semiconductors. 4,377,030, Cl. 29-576.00B.
Pfeifer, Josef; and Reinehr, Dieter, to Ciba-Geigy Corporation. Transparent copolyamide from isophorone diamine and substituted undecane diamine. 4,377,683, Cl. 528-336.000.
Pfizer Inc.: *See*—
Bigham, Eric C., 4,377,524, Cl. 260-245.20R.

Hess, Hans-Jurgen E.; Bindra, Jasjit S.; and Shah, Praful K., 4,377,581, Cl. 424-251.000.
Holland, Gerald F., 4,377,521, Cl. 260-239.0BA.
Myers, Robert F., 4,377,590, Cl. 424-271.000.

Pflingston, William J., to Polaroid Corporation. Diffusion transfer film units with application of processing composition between dye developer layer and silver halide emulsion layer. 4,377,632, Cl. 430-218.000.

Philip A. Hunt Chemical Corporation: *See*—
Toukhy, Medhat A.; and Klawansky, Leo, 4,377,631, Cl. 430-192.000.

Phillips Petroleum Company: *See*—
Bertus, Brent J.; and McKay, Dwight L., 4,377,494, Cl. 252-411.00R.
Farrar, Ralph C., 4,377,666, Cl. 525-132.000.
Leininger, James C., 4,377,651, Cl. 524-101.000.
Roberts, John S.; McKay, Dwight L.; and Bertus, Brent J., 4,377,504, Cl. 252-455.00Z.
Tuck, Lee; and Skraba, Frank W., 4,377,443, Cl. 203-1.000.
Vives, Van C.; and Brady, Donnie G., 4,377,660, Cl. 524-494.000.

Phillips Plastics Corp.: *See*—
Wollar, Burnell J., 4,377,358, Cl. 411-15.000.

Phillips, Richard A.: *See*—
Haddad, Theodore A.; Kondig, Walter; and Phillips, Richard A., 4,377,389, Cl. 8-506.000.

Pick, Richard D.: *See*—
Laros, Timothy J.; and Pick, Richard D., 4,377,473, Cl. 209-167.000.

Pickard, George L.: *See*—
Arends, Albert W.; Pickard, George L.; West, George A.; and Russell, Edward J., 4,377,377, Cl. 425-155.000.

Picker Corporation: *See*—
Sano, Richard M.; Steidley, John W.; Gillespie, Bruce M.; and Tinkel, Jack B., 4,377,752, Cl. 378-152.000.

Pico Electronics Limited: *See*—
Thompson, David R., 4,377,754, Cl. 307-114.000.

Picquendar, Jean-Edgar: *See*—
Benoit-Gonin, Roger; Berger, Jean-Luc; Fontanes, Sylvain; and Picquendar, Jean-Edgar, 4,377,760, Cl. 307-530.000.

Picut, Frederick R.: *See*—
Wilder, Joseph R.; Reick, Franklin G.; and Picut, Frederick R., 4,377,166, Cl. 128-278.000.

Pierpont, Ralph E., to Sprague Electric Company. Method for encapsulating a radial leaded electrical component. 4,377,548, Cl. 264-265.000.

Pierrat, Michel A. Log splitter. 4,377,190, Cl. 144-193.00A.

Pierson, Henri G. W. Vacuum belt filter. 4,377,479, Cl. 210-350.000.

Pierson, Henri G. W. Vacuum belt filter. 4,377,480, Cl. 210-350.000.

Pigerol, Charles: *See*—
Bouisset, Michel; Chignac, Michel; Grain, Claude; and Pigerol, Charles, 4,377,533, Cl. 260-465.100.

Pincha, Philip J., to Lortone, Inc. Hand cabbing apparatus. 4,377,057, Cl. 51-359.000.

Pioneer Electric Supply Co., Inc.: *See*—
Garmong, Victor H., 4,377,092, Cl. 74-41.000.

Pioneer Electronic Corporation: *See*—
Kamimura, Teturo; Komatsubara, Masahiro; Ando, Shizuo; and Inanaga, Takuzi, 4,377,829, Cl. 360-96.500.

Pisanu, Antonio. Asymmetrical anatomic arm-chair, particularly for odontological use. 4,377,308, Cl. 297-353.000.

Pitney Bowes Inc.: *See*—
Beck, Christian A., 4,377,337, Cl. 355-8.000.
Eckert, Alton B., Jr.; and Pritchett, Wayne W., 4,377,739, Cl. 219-497.000.
Hansen, Gary G.; and Cholakian, Gary D., 4,377,214, Cl. 177-25.000.

Pittman, Charles U., Jr.; and Hanes, Ronald, to Pittman, Charles U., Jr. 1,7-Octadiene synthesis. 4,377,719, Cl. 585-509.000.

Pittsburg & Midway Coal Mining Co., The: *See*—
Carr, Norman L.; Moon, William G.; and Prudich, Michael E., 4,377,464, Cl. 208-8.0LE.

Plastics Engineering Company: *See*—
D'Alelio, Gaetano F., deceased; and Waitkus, Phillip A., 4,377,525, Cl. 548-461.000.
D'Alelio, Gaetano F., deceased; and Waitkus, Phillip A., 4,377,673, Cl. 526-262.000.
Waitkus, Phillip A.; and D'Alelio, Gaetano F., 4,377,536, Cl. 260-544.00N.

Plunkett, Allan B., to General Electric Company. Pulse width modulated inverter machine drive. 4,377,779, Cl. 318-811.000.

Plymate, Robert R. Method of treating animals to resist infectious diseases. 4,377,569, Cl. 424-85.000.

Pocrnja, Anton; and Streich, Martin, to Linde Aktiengesellschaft. Methods for converting heat into mechanical energy and/or useful heat. 4,377,073, Cl. 60-693.000.

Poland, Donald R.: *See*—
Dumaine, Thomas J.; Danko, Joseph A.; and Poland, Donald R., 4,377,261, Cl. 241-222.000.

Polaroid Corporation: *See*—
Haas, Howard C.; and Moreau, Robert D., 4,377,654, Cl. 524-236.000.
Pflingston, William J., 4,377,632, Cl. 430-218.000.

Poler, Stanley. Contact lens or the like. 4,377,329, Cl. 351-160.00R.

Polytop Corporation: *See*—
Hazard, Robert E.; and Wilson, Woodrow S., 4,377,247, Cl. 222-517.000.

Pons, Bobby S.: *See*—
Bewick, Alan; Mellor, John M.; and Pons, Bobby S., 4,377,453, Cl. 204-78.000.

Popchock, Richard T.: *See*—
Lech, Thaddeus, Jr.; and Popchock, Richard T., 4,377,225, Cl. 192-107.00C.

Pope, James M.; Wood, Susan; and Harrison, Don E., to Westinghouse Electric Corp. Containing nuclear waste via chemical polymerization. 4,377,507, Cl. 252-629.000.

Porcelli, Gerard, to Societe Nationale d'etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.". Safety device for a rotating element of a turbine engine. 4,377,370, Cl. 415-9.000.

Porter, Clemmon: *See*—
Boylan, Francis J.; Porter, Clemmon; and Bruno, Olga D., 4,377,493, Cl. 252-321.000.

PPG Industries, Inc.: *See*—
Temple, Chester S., 4,377,498, Cl. 252-431.00C.

Prabhu, Ashok N.; and Hang, Kenneth W., to RCA Corporation. Overglaze inks. 4,377,642, Cl. 501-20.000.

Pracht, Hans: *See*—
Bergmann, Horst; Pracht, Hans; and Holloh, Klaus-Dieter, 4,377,147, Cl. 123-527.000.

Prelec, Krsto: *See*—
Hershcovitch, Ady; and Prelec, Krsto, 4,377,773, Cl. 315-111.810.

Preller, Hans, to Theodor Wuppermann GmbH. Method of and apparatus for the production of profile members and hollow bodies from a plurality of metal strips of constant thickness. 4,377,732, Cl. 219-10.430.

Price, Thomas J. Fishline sinker applicator. 4,377,027, Cl. 29-566.100.

Pritchett, Wayne W.: *See*—
Eckert, Alton B., Jr.; and Pritchett, Wayne W., 4,377,739, Cl. 219-497.000.

Probst, Manfred: *See*—
Lautenschlager, Hans-Heiner; Betzing, Hans; Stoll, Brigitte; and Probst, Manfred, 4,377,695, Cl. 548-305.000.

Procter & Gamble Company, The: *See*—
Geho, Walter B., 4,377,567, Cl. 424-1.000.

Produits Chimiques Ugine Kuhlmann: *See*—
Bachelard, Roland; and Barral, Robert, 4,377,566, Cl. 423-631.000.

Prom, James R.: *See*—
Boeckeler, Rudolph H.; and Prom, James R., 4,377,457, Cl. 204-159.160.

Prudich, Michael E.: *See*—
Carr, Norman L.; Moon, William G.; and Prudich, Michael E., 4,377,464, Cl. 208-8.0LE.

PTX-Pentronix, Inc.: *See*—
De Santis, Raymond P., 4,377,376, Cl. 425-78.000.

Purex Corporation: *See*—
Jones, John P., 4,377,492, Cl. 252-301.190.

Puskaric, Emile: *See*—
De Jaeger, Roger; Helioui, Moncef; and Puskaric, Emile, 4,377,558, Cl. 423-300.000.

Putter, Rolf: *See*—
Kaiser, Reinhard; Behre, Horst; Dammann, Jurgen; Putter, Rolf; and Vogel, Axel, 4,377,535, Cl. 260-505.00C.

Puumalainen, Kertti: *See*—
Venalainen, Heikki; Rantanen, Rauno; and Puumalainen, Kertti, 4,377,869, Cl. 378-50.000.

Pyrodex Corporation: *See*—
Levenson, Michael K., 4,377,426, Cl. 149-109.600.

Qit-Fer et Titane Inc.: *See*—
Lefebvre, Jean J., 4,377,289, Cl. 277-12.000.

Queen's University at Kingston: *See*—
Mackay, William B.; and Smith, Reginald W., 4,377,422, Cl. 148-137.000.

Quella, Ferdinand: *See*—
Pape, Heinz; and Quella, Ferdinand, 4,377,750, Cl. 250-458.100.

R. George S.A.: *See*—
Francois, Alain, 4,377,427, Cl. 156-73.200.

Radco Industries, Inc.: *See*—
Paul, William A.; and Paul, James A., 4,377,786, Cl. 324-426.000.

Rader Companies, Inc.: *See*—
Lindberg, Gunnar B., 4,377,474, Cl. 209-279.000.

Ragan, Marshall P., to FMC Corporation. Truck wheel clamp with floating spindle plate. 4,377,038, Cl. 33-203.180.

Ragland, Douglas. Wall construction. 4,377,060, Cl. 52-489.000.

Rail, Robert D.: *See*—
Haynes, Harvey H.; and Rail, Robert D., 4,377,509, Cl. 252-633.000.

Rais, Arnold, to M. Schaerer A.G. Coffee-making machine. 4,377,108, Cl. 99-290.000.

Ransley, Richard G.; and Sahm, William H., III, to General Electric Company. Fiber optic coupler. 4,377,322, Cl. 350-96.200.

Rantanen, Rauno: *See*—
Venalainen, Heikki; Rantanen, Rauno; and Puumalainen, Kertti, 4,377,869, Cl. 378-50.000.

Rasmussen, Elizabeth L.: *See*—
Buschmann, John C.; Rasmussen, Elizabeth L.; Webster, William C.; and Veltman, Preston L., 4,377,414, Cl. 106-85.000.

Rasmussen, Ole-Bendt. Manufacture of a textile-like reticular product from thermoplastic film. 4,377,544, Cl. 264-139.000.

Rasmusson, Gary H.; Johnston, David B. R.; and Arth, Glen E., deceased (by Arth, Rose B., executrix), to Merck & Co., Inc. 4-Aza-17β-substituted-5α-androstan-3-one-reductase inhibitors. 4,377,584, Cl. 424-258.000.

Rau, Karlheinz: *See*—
Brandt, Lutz; Kreutzer, Karl; Rau, Karlheinz; Schmidt, Horst; and Simmat, Fritz, 4,377,405, Cl. 65-136.000.
RCA Corporation: *See*—
Christopher, Todd J.; and Mehrotra, Gopi N., 4,377,788, Cl. 330-136.000.
Hoover, Merle V., 4,377,789, Cl. 330-253.000.
Luz, David W., 4,377,776, Cl. 315-411.000.
Prabhu, Ashok N.; and Hang, Kenneth W., 4,377,642, Cl. 501-20.000.
Reitmeier, Glenn A., 4,377,820, Cl. 358-21.00R.
Whitley, George J., 4,377,026, Cl. 29-564.100.
Willis, Donald H., 4,377,775, Cl. 315-411.000.
Realex Corporation: *See*—
Workman, James P.; and Hudson, Larry L., 4,377,106, Cl. 92-23.000.
Reclamet, Inc.: *See*—
Areaux, Larry D.; and Dudley, Russell D., 4,377,259, Cl. 241-73.000.
Reed, Marion G., to Chevron Research Company. Stabilizing clay soil with hydroxy-aluminum solution. 4,377,419, Cl. 106-900.000.
Reel, Henning: *See*—
Schundehutte, Karl H.; Reel, Hesning; and Kruckenberg, Winfried, 4,377,390, Cl. 8-671.000.
Reeves, Clarence C.: *See*—
Levey, Gustave S.; Reeves, Clarence C.; and Owens, Donald R., 4,377,838, Cl. 361-228.000.
Regie Nationale des Usines Renault: *See*—
Chevalier, Claude; Bouvet, Jean-Marie; and Parthuisot, Jean P., 4,377,226, Cl. 192-3.300.
Reick, Franklin G.: *See*—
Wilder, Joseph R.; Reick, Franklin G.; and Picut, Frederick R., 4,377,166, Cl. 128-278.000.
Reinehr, Dieter: *See*—
Pfeifer, Josef; and Reinehr, Dieter, 4,377,683, Cl. 528-336.000.
Reinkenhof, Josef: *See*—
Sternfeld, Hans J.; Reinkenhof, Josef; and Lambrecht, Heinrich, 4,377,067, Cl. 60-39.550.
Reiss, Harold, to Levolor Lorentzen, Inc. Venetian blind color sampler packet. 4,377,232, Cl. 206-44.110.
Reitmeier, Glenn A., to RCA Corporation. Adaptive error concealment. 4,377,820, Cl. 358-21.00R.
Renholta, Roy J. Laminated tape for imprinting. 4,377,050, Cl. 40-615.000.
Renken, Henry A.: *See*—
Blomgren, Oscar C., Jr.; and Renken, Henry A., 4,377,839, Cl. 361-233.000.
Research and Development Institute, Inc. at Montana State University: *See*—
Strobel, Gary A., 4,377,571, Cl. 424-93.000.
Retallick, William B. Low pressure combustor for generating steam downhole. 4,377,205, Cl. 166-59.000.
Retzer, Michael H.: *See*—
Janc, Robert V.; Robins, David S.; and Retzer, Michael H., 4,377,866, Cl. 375-94.000.
Rhone-Poulenc Agrochimie: *See*—
Steffens, James J., 4,377,408, Cl. 71-92.000.
Rhone-Poulenc Industries: *See*—
Bouniot, Albert; Couraud, Robert; and Lartigau, Guy, 4,377,685, Cl. 536-119.000.
Rico, Isabelle; and Wakselman, Claude, 4,377,711, Cl. 568-588.000.
Rhone-Poulenc-Textile: *See*—
Menault, Jacques; and Rodier, Henry, 4,377,648, Cl. 524-35.000.
Rhythm Watch Company, Limited: *See*—
Yamada, Shinji; and Nagoya, Mitsuru, 4,377,345, Cl. 368-245.000.
Rico, Isabelle; and Wakselman, Claude, to Rhone-Poulenc Industries. Novel aromatic bromopolyfluoroalkyl ethers and method for the preparation thereof. 4,377,711, Cl. 568-588.000.
Riebli, Peter: *See*—
Hubele, Adolf; Eckhardt, Wolfgang; and Riebli, Peter, 4,377,587, Cl. 424-269.000.
Rivier, Catherine L.; Rivier, Jean E. F.; and Vale, Wylie W., Jr., to Salk Institute For Biological Studies, The. Contraceptive treatment of male mammals. 4,377,574, Cl. 424-177.000.
Rivier, Jean E. F., to Salk Institute for Biological Studies. Mobile phase for liquid chromatography. 4,377,482, Cl. 210-635.000.
Rivier, Jean E. F.: *See*—
Rivier, Catherine L.; Rivier, Jean E. F.; and Vale, Wylie W., Jr., 4,377,574, Cl. 424-177.000.
Roark, Carolyn K.: *See*—
Roark, Doyle W.; and Roark, Carolyn K., 4,377,053, Cl. 47-42.000.
Roark, Doyle W.; and Roark, Carolyn K. Telescoping prop particularly adapted for support or spreading of tree branches. 4,377,053, Cl. 47-42.000.
Robert Bosch GmbH: *See*—
Holzbaur, Siegfried; and Schuster, Gregor, 4,377,255, Cl. 236-93.00R.
Latsch, Reinhard, 4,377,140, Cl. 123-415.000.
Linder, Ernst; Muller, Klaus; and Maurer, Helmut, 4,377,086, Cl. 73-35.000.
Roberts, John S.; McKay, Dwight L.; and Bertus, Brent J., to Phillips Petroleum Company. Cracking catalyst improvement with gallium compounds. 4,377,504, Cl. 252-455.00Z.
Roberts, Ralph A. Denture support frame. 4,377,382, Cl. 433-176.000.
Robertson, Albert E.: *See*—
Maul, Peter L.; and Robertson, Albert E., 4,377,416, Cl. 106-98.000.
Robins, David S.: *See*—
Janc, Robert V.; Robins, David S.; and Retzer, Michael H., 4,377,866, Cl. 375-94.000.
Robinson, Martin A.: *See*—
Nychka, Henry R.; Hino, John B.; Eibeck, Richard E.; and Robinson, Martin A., 4,377,715, Cl. 570-123.000.
Robinson, Philip I.: *See*—
Campbell, John, Jr.; Russell, Larry H.; and Robinson, Philip I., 4,377,072, Cl. 60-682.000.
Rockwell International Corporation: *See*—
Campbell, John, Jr.; Russell, Larry H.; and Robinson, Philip I., 4,377,072, Cl. 60-682.000.
Huffman, Charles E., 4,377,861, Cl. 370-112.000.
Rodier, Henry: *See*—
Menault, Jacques; and Rodier, Henry, 4,377,648, Cl. 524-35.000.
Rodot, Francois, to Societe Nationale Elf Aquitaine (Production). Device for acoustically controlling the setting and hardening characteristics of cements. 4,377,087, Cl. 73-594.000.
Roes, John B.: *See*—
Hayman, Charles L.; Roes, John B.; and Moore, Royal C., Jr., 4,377,828, Cl. 360-88.000.
Roesner, Bruce B., to Burroughs Corporation. Static semiconductor memory with reduced components and interconnections. 4,377,856, Cl. 365-154.000.
Rolls, George H.; Beveridge, Andrew J.; Challener, Ronald T.; and Stuart, William, to Star Offshore Services Limited; and Oil Mop (UK) Limited. Separating one liquid from another. 4,377,478, Cl. 210-242.300.
Romaine, John W. Compression bandage. 4,377,160, Cl. 128-156.000.
Rooney, Clarence S.: *See*—
Cragoe, Edward J., Jr.; Rooney, Clarence S.; and Williams, Haydn W. R., 4,377,588, Cl. 424-270.000.
Rose, Andrew M., to Memorex Corporation. Servo positioning control system for a data storage apparatus. 4,377,827, Cl. 360-78.000.
Ross, Sidney D.: *See*—
Barry, John E.; Finkelstein, Manuel; and Ross, Sidney D., 4,377,692, Cl. 546-186.000.
Rossetti, James J., to Lakeshore Commercial Finance Corporation. Container end and closure therefor. 4,377,244, Cl. 220-268.000.
Rossler, Eleanor J.: *See*—
Parsen, Frank E.; and Rossler, Eleanor J., 4,377,625, Cl. 429-198.000.
Rothberg, Michael R. Process for removal of radioactive materials from aqueous solutions. 4,377,508, Cl. 252-631.000.
Rothchild, Ronald D., to Airco, Inc. Methods and apparatus for expanding tobacco. 4,377,173, Cl. 131-291.000.
Roto Cleaner, Inc.: *See*—
Cain, Gerald E., 4,377,018, Cl. 15-322.000.
Rottmaier, Ludwig: *See*—
Giesecke, Henning; Merten, Rudolf; and Rottmaier, Ludwig, 4,377,694, Cl. 548-264.000.
Ruckel, Erwin R.; and Epstein, Martin, to Arizona Chemical Company. Urethane-modified rosin ester and process for preparing the same. 4,377,510, Cl. 260-97.000.
Ruhenstroth-Bauer, Gerhard; Goldberg, Michel; and Schneider, Hubertus, to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften E.V. Method for producing factor for the stimulation of the liver cell proliferation rate. 4,377,514, Cl. 260-112.00R.
Russell, Edward J.: *See*—
Arends, Albert W.; Pickard, George L.; West, George A.; and Russell, Edward J., 4,377,377, Cl. 425-155.000.
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Campbell, John, Jr.; Russell, Larry H.; and Robinson, Philip I., 4,377,072, Cl. 60-682.000.
Russo, Michael S., to New England Nuclear Corporation. Refrigerant and method for shipping perishable materials. 4,377,075, Cl. 62-372.000.
Rutgerswerke Aktiengesellschaft: *See*—
Giebeler, Eberhard; Bluhm, Bernhard; Alscher, Arnold; Moraw, Klaus; Collin, Gerd; and Nilles, Heinzpeter, 4,377,040, Cl. 34-16.500.
Maurer, Manfred; Orth, Winfried; and Fickert, Werner, 4,377,699, Cl. 548-469.000.
Rzasa, Ronald P.; and Wallach, Ronald M., to Wallach Surgical Instruments, Inc. Cryosurgical instrument. 4,377,168, Cl. 128-303.100.
Sabbota, Howard I., to Future Teck. Surgical ventilating apparatus. 4,377,164, Cl. 128-207.140.
Sabo, Bert M.: *See*—
Vadas, Leslie; and Sabo, Bert M., 4,377,380, Cl. 433-89.000.
Sabol, Albert R.; and Petrellis, Nicolas C., to Standard Oil Company (Indiana). Ammonia catalyzed preparation of zinc dihydrocarbyl dithiophosphates. 4,377,527, Cl. 260-429.900.
Sadowski, Anthony J., to Nalco Chemical Company. Process for reducing slag build-up. 4,377,118, Cl. 110-343.000.
Sahm, William H., III: *See*—
Ransley, Richard G.; and Sahm, William H., III, 4,377,322, Cl. 350-96.200.
St. Joseph Bank and Trust Company, executor: *See*—
D'Alelio, Gaetano F., deceased; and Waitkus, Phillip A., 4,377,525, Cl. 548-461.000.
D'Alelio, Gaetano F., deceased; and Waitkus, Phillip A., 4,377,673, Cl. 526-262.000.
Saito, Masato: *See*—
Tsuchihashi, Michihiro; Suzuki, Ryo; Watanabe, Keiji; and Saito, Masato, 4,377,772, Cl. 315-63.000.

Saito, Toshio; Ito, Motoya; Takahashi, Noriyoshi; and Sato, Masaki, to Hitachi, Ltd. Fault detection apparatus for rotor winding of rotary machine. 4,377,784, Cl. 324-158.0MG.

Saitoh, Hiroshi: *See*—
Itoh, Tsutomu; Furuya, Nobuo; Ouchi, Kenji; Shimizu, Takeo; and Saitoh, Hiroshi, 4,377,603, Cl. 427-25.000.

Sakaguchi, Masashi: *See*—
Otani, Takeshi; Watanabe, Osamu; and Sakaguchi, Masashi, 4,377,425, Cl. 148-437.000.

Sakai, Masaaki: *See*—
Asagi, Osamu; and Sakai, Masaaki, 4,377,777, Cl. 318-68.000.

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Kawabata, Takashi; Hosoe, Kazuya; Shinoda, Nobuhiko; Sakai, Shinji; and Kinoshita, Takao, 4,377,742, Cl. 250-204.000.

Sakai, Tokuji: *See*—
Sato, Kimihiko; Sakai, Tokuji; Yamasaki, Yasuo; Onodera, Tamio; and Sumitani, Koji, 4,377,718, Cl. 585-467.000.

Sakai, Yoshio; Masuhara, Toshiaki; Minato, Osamu; Sasaki, Toshio; Katto, Hisao; Hashimoto, Norikazu; Muramatsu, Shin-ichi; and Tomozawa, Akihiro, to Hitachi, Ltd. Semiconductor device. 4,377,819, Cl. 357-59.000.

Sakakiyama, Ryuzo; and Usunami, Shoichi, to Fuji Jukogyo Kabushiki Kaisha. Electro-magnetic clutch control system for automobiles. 4,377,223, Cl. 192-3.580.

Sakamoto, Shinichi: *See*—
Amano, Matsuo; Sugawara, Toru; Mouri, Yasunori; Aochi, Yoshikazu; and Sakamoto, Shinichi, 4,377,137, Cl. 123-179.00B.

Sakaue, Tatsuo; and Sato, Chikara, to Tokyo Shibaura Denki Kabushiki Kaisha. Charge transfer device comb filter with improved frequency response. 4,377,794, Cl. 333-165.000.

Sako, Yoshitaka: *See*—
Yasui, Bompei; Miyamoto, Tomohisa; Hiraoka, Katsuyuki; and Sako, Yoshitaka, 4,377,691, Cl. 546-185.000.

Sakurai, Hideo: *See*—
Makino, Kenya; Sakurai, Hideo; Watanabe, Masaru; and Nishimura, Toshiyuki, 4,377,671, Cl. 526-124.000.

Sakurai, Hisaya; Hamada, Minoru; and Matsuzaki, Kazuhiko, to Asahi Kasei Kogyo Kabushiki Kaisha. Polyacetal and process of producing same. 4,377,667, Cl. 525-400.000.

Saletta, Gary F.: *See*—
Elms, Robert T.; Saletta, Gary F.; and Mercier, Bernard J., 4,377,836, Cl. 361-96.000.

Salk Institute For Biological Studies, The: *See*—
Rivier, Catherine L.; Rivier, Jean E. F.; and Vale, Wylie W., Jr., 4,377,574, Cl. 424-177.000.
Rivier, Jean E. F., 4,377,482, Cl. 210-635.000.

Sandford, Don L. Storage of hand-propelled vehicles. 4,377,227, Cl. 194-4.00R.

Sandor, Joseph: *See*—
Davis, C. Paul; and Sandor, Joseph, 4,377,831, Cl. 360-128.000.

Sandow, Jurgen K.: *See*—
Stache, Ulrich; Fritsch, Werner; Alpermann, Hans G.; and Sandow, Jurgen K., 4,377,575, Cl. 424-243.000.

Sandoz Ltd.: *See*—
Mialin, Roland; Uehlinger, Hanspeter; and Oppliger, Max, 4,377,517, Cl. 260-153.000.

Sanina, Irina V.: *See*—
Lopukhin, Jury M.; Petrov, Rem V.; Arion, Vitaly Y.; Breusov, Jury N.; Gladysheva, Tatyana V.; Sanina, Irina V.; Lebedev, Vasily V.; Kirzon, Serafima S.; and Ivanushkin, Evgeny F., 4,377,511, Cl. 260-112.00R.

Sankyo Company, Limited: *See*—
Hiraoka, Tetsuo; Kobayashi, Takeo; Ishida, Noboru; and Sugawara, Shinichi, 4,377,591, Cl. 424-274.000.

Sano, Richard M.; Steidley, John W.; Gillespie, Bruce M.; and Tinkel, Jack B., to Picker Corporation. Scintillation camera radiation shielding. 4,377,752, Cl. 378-152.000.

Sanofi: *See*—
Bouisset, Michel; Chignac, Michel; Grain, Claude; and Pigerol, Charles, 4,377,533, Cl. 260-465.100.
Gero, Stephan; Cleophax, Jeanine; Barriere, Jean-Claude; and Cier, Andre, 4,377,704, Cl. 549-39.000.

Santarelli, Francis L. Self securing tonneau cover. 4,377,307, Cl. 296-136.000.

Santhanam, Chakra J., to Arthur D. Little, Inc. Method and apparatus for moving coal including one or more intermediate periods of storage. 4,377,356, Cl. 406-109.000.

Santucci, Sergio. Combination guitar and bass. 4,377,101, Cl. 84-1.160.

Saperstein, Zalman P., to Modine Manufacturing Company. Method of making a heat exchanger. 4,377,024, Cl. 29-157.30C.

Sasaki, Noriyoshi: *See*—
Kikuoka, Takao; Yamamoto, Hiroaki; Sasaki, Noriyoshi; Wakui, Kotaro; Murakami, Keinosuke; Ohnishi, Kazunori; Kawamura, Gou; Noguchi, Hiroshi; and Ukigaya, Fumio, 4,377,787, Cl. 324-431.000.

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Sakai, Yoshio; Masuhara, Toshiaki; Minato, Osamu; Sasaki, Toshio; Katto, Hisao; Hashimoto, Norikazu; Muramatsu, Shin-ichi; and Tomozawa, Akihiro, 4,377,819, Cl. 357-59.000.

Satake Engineering Co. Ltd.: *See*—
Satake, Toshihiko, 4,377,116, Cl. 110-235.000.

Satake, Toshihiko, to Satake Engineering Co. Ltd. Furnace for burning husk. 4,377,116, Cl. 110-235.000.

Sato, Chikara: *See*—
Sakaue, Tatsuo; and Sato, Chikara, 4,377,794, Cl. 333-165.000.

Sato, Kimihiko; Sakai, Tokuji; Yamasaki, Yasuo; Onodera, Tamio; and Sumitani, Koji, to Teijin Petrochemical Industries Ltd. Process for producing p-xylene. 4,377,718, Cl. 585-467.000.

Sato, Masaki: *See*—
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Sato, Yoichi: *See*—
Nishikawa, Masao; Aoki, Takashi; and Sato, Yoichi, 4,377,217, Cl. 180-143.000.

Saunders Archery Co.: *See*—
Saunders, Charles A., 4,377,152, Cl. 124-88.000.

Saunders, Charles A., to Saunders Archery Co. Cable guard for compound bow. 4,377,152, Cl. 124-88.000.

Sautter, Helmuth O.; and Swicker, Donald B., to Bell Telephone Laboratories, Incorporated. Arrangement for providing a flickerless ordered dither image for a video display. 4,377,821, Cl. 358-133.000.

Sawakabu, Hitoshi: *See*—
Koizumi, Hideaki; and Sawakabu, Hitoshi, 4,377,342, Cl. 356-307.000.

Schafer, Hans: *See*—
Herbrechtsmeier, Peter; Schafer, Hans; and Steiner, Rudolf, 4,377,395, Cl. 55-38.000.

Schedele, Helmut, to Siemens Aktiengesellschaft. Electromagnetic relay. 4,377,798, Cl. 335-202.000.

Schelzig, Manfred. Solar collectors and process for the manufacture thereof. 4,377,156, Cl. 126-450.000.

Schiffbauer, William H.; and Watson, Richard A., to United States of America, Interior. Selective paging and intercommunication system. 4,377,726, Cl. 179-1.00H.

Schillinger, Joseph F., to Champion International Corporation. Convertible eight-cell carton. 4,377,252, Cl. 229-28.00R.

Schleppinghoff, Bernhard, to EC Erdolchemie GmbH. Process for the preparation of a mixture consisting essentially of iso-butene oligomers and methyl tert.-butyl ether, its use, and fuels containing such mixture. 4,377,393, Cl. 44-53.000.

Schluer, Karl-Heinz: *See*—
Bardenhagen, Dietrich; Hausler, Nikolaus; Niemann, Helmut; Greve, Heinz; and Schluer, Karl-Heinz, 4,377,098, Cl. 83-310.000.

Schmidle, Claude J., to Thiokol Corporation. Photocurable compositions based on acrylate polyester urethanes. 4,377,679, Cl. 528-75.000.

Schmidt, Gunther; and Bergamaschi, Mario, to Karl Thomae Gesellschaft mit beschrankter Haftung. 5-(Heterocyclic amino-propionyl)-5,10-dihydro-11H-dibenzo[b,e][1,4]diazepin-11-ones. 4,377,576, Cl. 424-244.000.

Schmidt, Horst: *See*—
Brandt, Lutz; Kreutzer, Karl; Rau, Karlheinz; Schmidt, Horst; and Simmat, Fritz, 4,377,405, Cl. 65-136.000.

Schmidt, Paul J.: *See*—
Crounse, Nathan N.; and Schmidt, Paul J., 4,377,698, Cl. 548-455.000.

Schneider, Bernd, to Siemens Aktiengesellschaft. Splicing device for producing a light waveguide connection. 4,377,323, Cl. 350-96.210.

Schneider, Hubertus: *See*—
Ruhenstroth-Bauer, Gerhard; Goldberg, Michel; and Schneider, Hubertus, 4,377,514, Cl. 260-112.00R.

Schneider, Kurt: *See*—
Hahn, Erwin; Lach, Dietrich; Schneider, Kurt; Strickler, Rainer; and Streicher, Rolf, 4,377,387, Cl. 8-94.170.

Schneider, Ronald A., to Chevron Research Company. Copper stabilized dipping solution for a photovoltaic device incorporating a Cu_xS layer. 4,377,604, Cl. 427-75.000.

Schonhorn, Harold; and Sharpe, Louis H., to Bell Telephone Laboratories, Incorporated. Prevention of surface mass migration by means of a polymeric surface coating. 4,377,619, Cl. 428-333.000.

Schopper, Bernd; Tandler, Peter; and Lowe, Derek, to ITT Industries, Inc. Pressure reducer for hydraulic brake systems. 4,377,176, Cl. 137-493.200.

Schreiner, Charles P., to Westinghouse Electric Corp. Pallet frame. 4,377,241, Cl. 211-133.000.

Schreyer, Gerd: *See*—
Hentschel, Klaus; Bittner, Friedrich; Schreyer, Gerd; and Franz, Georg, 4,377,344, Cl. 366-173.000.

Schroeder, Jerry P.: *See*—
Beaver, Jack L.; Schroeder, Jerry P.; and Whitney, John M., 4,377,346, Cl. 374-1.000.

Schultz, John T.; and Bishop, Clifford F., to Square D Company. Circuit breaker with snap action magnetic trip actuator. 4,377,795, Cl. 335-23.000.

Schulz, Martin, Jr.; and Bane, James E., to Steadley Company. Steel wire foundation. 4,377,279, Cl. 267-103.000.

Schundehutte, Karl H.; Reel, Henning; and Kruckenberg, Winfried, to Bayer Aktiengesellschaft. Acetoacetic arylide azo dyestuffs for synthetic materials, especially polyester. 4,377,390, Cl. 8-671.000.

Schuster, Gregor: *See*—
Holzbaur, Siegfried; and Schuster, Gregor, 4,377,255, Cl. 236-93.00R.

Schuster, Hans-Dieter: *See*—
Abthoff, Jorg; Schuster, Hans-Dieter; Langer, Hans-Joachim; and Laszlo, Marijan, 4,377,135, Cl. 123-25.00J.

Schwalbach, Joseph C. Stethoscope having means for measuring pulse frequency. 4,377,727, Cl. 179-1.05T.

Schwarz, Otto; Linnau, Yendra; Loblich, Franz; and Seelich, Thomas, to Immuno Aktiengesellschaft fur Chemisch-Medizinische Produkte. Tissue adhesive. 4,377,572, Cl. 424-101.000.

Schwieger, Lonny D. Animal actuated feed and water dispensing apparatus. 4,377,130, Cl. 119-51.500.
Seagrams Distillers Limited: *See*—
Snedker, Robert, 4,377,242, Cl. 215-21.000.
Seale, Kenneth C.: *See*—
Sweeney, Nevin J.; and Seale, Kenneth C., 4,377,649, Cl. 524-49.000.
Seale, Virgil L.; Stanford, James R.; Briscoe, James E.; and Penny, Glenn S., to Nalco Chemical Company. Quaternized epichlorohydrin adducts of perfluoro substituted ethanols. 4,377,710, Cl. 564-281.000.
Sealed Air Corporation: *See*—
Geise, Howard F., 4,377,257, Cl. 239-419.300.
Sebert, Wolfgang: *See*—
Henning, Hans-Georg; and Sebert, Wolfgang, 4,377,815, Cl. 346-140.00R.
Sedko, Anatoly P.: *See*—
Gubin, Ivan P.; Machavariani, Sergei G.; Efremovtsev, Nikolai S.; Kovalenko, Viktor A.; Mozolev, Alexandr V.; Nikolaev, Sergei I.; Nikolaev, Georgy I.; Guriyanov, Viktor A.; Temnikov, Anatoly I.; Tyryshkin, Evgeny E.; Dubynin, Nikolai G.; Kogan, Volf Z.; Ljubkin, Anatoly P.; and Sedko, Anatoly P., 4,377,310, Cl. 299-13.000.
Seelenbinder, Terry G.; Jackson, Richard W.; and Kajohn, Thomas D., Jr., to AM International, Inc. Attachment for eliminating ammonia fumes from diazo copiers. 4,377,331, Cl. 354-300.000.
Seelich, Thomas: *See*—
Schwarz, Otto; Linnau, Yendra; Loblich, Franz; and Seelich, Thomas, 4,377,572, Cl. 424-101.000.
Seifert, Gerd: *See*—
Aichinger, Horst; and Seifert, Gerd, 4,377,748, Cl. 378-110.000.
Seimiya, Motoo, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of preparing silicon carbide. 4,377,563, Cl. 423-345.000.
Seiwa Ltd.: *See*—
Nakamura, Nobunosuke; and Kimoto, Hisanori, 4,377,202, Cl. 165-86.000.
Seller, Barry, to Fox Manufacturing Company Pty. Limited. Multi-purpose mining machine. 4,377,311, Cl. 299-75.000.
Sellner, Kurt, to Messrs. Cullman Handelsgesellschaft fuer Verbrauchsgueter m.b.H. Stand for optical devices, particularly cameras. 4,377,269, Cl. 248-188.600.
Semiconductor Research Foundation: *See*—
Nishizawa, Jun-ichi; and Ohmi, Tadahiro, 4,377,817, Cl. 357-22.000.
Semon, Albert L. Three-way valve. 4,377,182, Cl. 137-596.100.
Senoo, Tetsuo, to Nissan Motor Company, Limited. Level regulator for an automotive vehicle. 4,377,293, Cl. 280-6.00R.
Serlin, Irving; and Gardner, Donald M., to Monsanto Company. Electrographic recording material. 4,377,612, Cl. 428-212.000.
Serlin, Irving; and Gardner, Donald M., to Monsanto Company. Coating compositions comprising allylic alcohol interpolymers. 4,377,656, Cl. 524-413.000.
Setaka, Nobuo, to National Institute for Researches in Inorganic Materials. Process for producing diamond powder by shock compression. 4,377,565, Cl. 423-446.000.
Seulen, Gerhard W. Through-flow monitor for liquid or gaseous media. 4,377,090, Cl. 73-861.740.
Shadbourne, Alan P., to Garrett Corporation, The. Turbocharger control actuator. 4,377,070, Cl. 60-602.000.
Shah, Praful K.: *See*—
Hess, Hans-Jurgen E.; Bindra, Jasjit S.; and Shah, Praful K., 4,377,581, Cl. 424-251.000.
Shanks, George C.: *See*—
United States of America, National Aeronautics and Space Administration; and Shanks, George C., 4,377,089, Cl. 73-818.000.
Shapiro, Jay H.; and Peck, Bernard J., to Peck Meat Packing Corporation. Restructured meat product for roasting and method of preparing same. 4,377,597, Cl. 426-92.000.
Sharp Kabushiki Kaisha: *See*—
Kasubuchi, Takeshi; Hara, Takeo; and Ozawa, Kaoru, 4,377,825, Cl. 360-48.000.
Tonomura, Toshiya; and Nishiuma, Saburo, 4,377,155, Cl. 126-443.000.
Wada, Yoshihiro, 4,377,171, Cl. 128-736.000.
Yamaguchi, Masumi; Kumagai, Yoshimi; and Kotaka, Kazunari, 4,377,733, Cl. 219-10.55B.
Sharpe, Louis H.: *See*—
Schonhorn, Harold; and Sharpe, Louis H., 4,377,619, Cl. 428-333.000.
Shaw Aero Devices, Inc.: *See*—
Shaw, Francis; and Jones, David W., 4,377,243, Cl. 220-210.000.
Shaw, Francis; and Jones, David W., to Shaw Aero Devices, Inc. Lock for fuel tank cover. 4,377,243, Cl. 220-210.000.
Shekel, Joseph; and DeStefano, Joseph, to Auto-Line Manufacturing Corp. Adapter for connecting auxiliary cable to side terminal battery. 4,377,317, Cl. 339-29.00B.
Shell Oil Company: *See*—
Collins, James H., 4,377,658, Cl. 524-425.000.
Durbin, Daniel P.; Danforth, Richard L.; and Lutz, Robert G., 4,377,647, Cl. 523-518.000.
Himes, Glenn R., 4,377,655, Cl. 524-313.000.
O'Donnell, Albert E.; and Gum, Clarence R., 4,377,499, Cl. 252-431.00R.
van Tilborg, Wilhelmus J. M.; and Smit, Cornelis J., 4,377,451, Cl. 204-59.00R.
Shen, Tsung-Ying: *See*—
Durette, Philippe L.; and Shen, Tsung-Ying, 4,377,570, Cl. 424-88.000.
Shepherd, Dale H.; and Zifferer, Lothar R. Tube corrugating apparatus and method. 4,377,083, Cl. 72-68.000.
Sherritt Gordon Mines Limited: *See*—
Hofirek, Zoenek, 4,377,556, Cl. 423-42.000.
Shibasaki, Ichiro: *See*—
Ohmura, Kaoru; Shibasaki, Ichiro; and Kimura, Takeo, 4,377,652, Cl. 524-104.000.
Shigyo, Masamichi: *See*—
Yoshida, Satoshi; Takeuchi, Hideaki; Shigyo, Masamichi; Iijima, Toshio; and Ikeda, Tomoaki, 4,377,607, Cl. 427-250.000.
Shihabi, David S., to Mobil Oil Corporation. Maintaining catalytic activity of sodium aluminosilicates. 4,377,469, Cl. 208-111.000.
Shimizu, Hirokazu: *See*—
Sugino, Takashi; Wada, Masaru; Shimizu, Hirokazu; and Itoh, Kunio, 4,377,865, Cl. 372-45.000.
Shimizu, Takeo: *See*—
Itoh, Tsutomu; Furuya, Nobuo; Ouchi, Kenji; Shimizu, Takeo; and Saitoh, Hiroshi, 4,377,603, Cl. 427-25.000.
Shimono, Muchiji: *See*—
Takahashi, Kihei; Terada, Seiko; and Shimono, Muchiji, 4,377,189, Cl. 139-35.000.
Shimotori, Kazuhiro: *See*—
Yoshihara, Tsutomu; Shimotori, Kazuhiro; and Nagayama, Yasuji, 4,377,756, Cl. 307-296.00R.
Shin-Kobe Electric Machinery Co., Ltd.: *See*—
Kikuoka, Takao; Yamamoto, Hiroaki; Sasaki, Noriyoshi; Wakui, Kotaro; Murakami, Keinosuke; Ohnishi, Kazunori; Kawamura, Gou; Noguchi, Hiroshi; and Ukigaya, Fumio, 4,377,787, Cl. 324-431.000.
Shinji, Morozumi: *See*—
Tatsuhi, Asakawa; and Shinji, Morozumi, 4,377,781, Cl. 323-299.000.
Shinoda, Nobuhiko: *See*—
Kawabata, Takashi; Hosoe, Kazuya; Shinoda, Nobuhiko; Sakai, Shinji; and Kinoshita, Takao, 4,377,742, Cl. 250-204.000.
Shinozaki, Nozomu: *See*—
Neki, Shigeo; Shinozaki, Nozomu; and Dohi, Takashi, 4,377,778, Cl. 318-341.000.
Shiraishi, Kunihiko: *See*—
Nomura, Mitsuo; Amano, Shigeru; Okubo, Sho; Hosaka, Takuo; Shiraishi, Kunihiko; and Adachi, Ryuzi, 4,377,413, Cl. 106-76.000.
Shiraishi, Yoshihisa; Nakagawa, Kazuhiro; Nakata, Chiaki; and Ohasi, Koiti, to Sumitomo Chemical Company, Limited; and Taoka Chemical Co., Ltd. Adhesive composition. 4,377,490, Cl. 252-188.30R.
Shirakawa, Norio; Tomioka, Hiromi; Koizumi, Masuo; Takeuchi, Masaki; Sugiyama, Hiroshi; Okada, Masanori; Yoshimoto, Masahiro; Iwane, Yoshitaka; and Murakami, Yasushi, to Chugai Seiyaku Kabushiki Kaisha. Isonicotinanilide derivatives, plant growth regulating compositions and use. 4,377,407, Cl. 71-76.000.
Shiraki, Toshinori; Yamori, Akio; and Morita, Hideo, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for producing block copolymer resin. 4,377,665, Cl. 525-250.000.
Shirota, Kensho: *See*—
Fukuma, Daizo; Suzuki, Shigeru; Shirota, Kensho; and Harada, Kunihiro, 4,377,678, Cl. 528-75.000.
Shizuki, Tatsuhiko: *See*—
Masakatsu, Ohguchi; Shizuki, Tatsuhiko; and Kashihara, Takao, 4,377,682, Cl. 528-301.000.
Showa Aluminum Corp.: *See*—
Otani, Takeshi; Watanabe, Osamu; and Sakaguchi, Masashi, 4,377,425, Cl. 148-437.000.
Showa Aluminum Ind. K.K.: *See*—
Otani, Takeshi; Watanabe, Osamu; and Sakaguchi, Masashi, 4,377,425, Cl. 148-437.000.
Siebentritt, Carl R.: *See*—
Kronenberg, Stanley; Levine, Harry; McLaughlin, William L.; and Siebentritt, Carl R., 4,377,751, Cl. 250-474.100.
Siegwart, Emil. Flexible corrugated tube. 4,377,188, Cl. 138-122.000.
Siemens Aktiengesellschaft: *See*—
Aichinger, Horst; and Seifert, Gerd, 4,377,748, Cl. 378-110.000.
Konemann, Bernd; Mucha, Joachim; and Zwiehoff, Gunther, 4,377,757, Cl. 307-303.000.
Mueller, Franz, 4,377,868, Cl. 378-019.000.
Muerkl, Helmut, 4,377,250, Cl. 225-2.000.
Pape, Heinz; and Quella, Ferdinand, 4,377,750, Cl. 250-458.100.
Pettenpaul, Ewald; Huber, Jakob; and Weidlich, Herbert, 4,377,030, Cl. 29-576.00B.
Schedele, Helmut, 4,377,798, Cl. 335-202.000.
Schneider, Bernd, 4,377,323, Cl. 350-96.210.
Simmat, Fritz: *See*—
Brandt, Lutz; Kreutzer, Karl; Rau, Karlheinz; Schmidt, Horst; and Simmat, Fritz, 4,377,405, Cl. 65-136.000.
Simon, Donald R.; and Strowe, Robert J., to PepsiCo Inc. Capacitive switching panel. 4,377,049, Cl. 40-465.000.
Simpson, Roy. Hand-held measuring and calculating device. 4,377,850, Cl. 364-561.000.
Sindelar, William F. Homokinetic universal joint. 4,377,385, Cl. 464-142.000.
Singer, Robert: *See*—
Merz, Ekkehard; and Singer, Robert, 4,377,433, Cl. 156-326.000.
Singh, Pritam: *See*—
Parker, Alan J.; Singh, Pritam; and Avraamides, James, 4,377,623, Cl. 429-15.000.
Sittig, Roland, to BBC Brown, Boveri & Company Limited. Semiconductor element with zone guard rings. 4,377,816, Cl. 357-13.000.

Skaletzky, Louis L., to Upjohn Company, The. Diuretic 2,6-diaryl-4-pyridine carboxylic acids. 4,377,586, Cl. 424-266.000.
SKF Kugellagerfabriken GmbH: *See*—
Olschewski, Armin; Hetterich, Hermann; and Horling, Peter, 4,377,313, Cl. 308-216.000.
Skraba, Frank W.: *See*—
Tuck, Lee; and Skraba, Frank W., 4,377,443, Cl. 203-1.000.
Slaton, Hugh M. Pail washing machine. 4,377,014, Cl. 15-56.000.
Slattery, Dugmore D. Snapper head for harvesting maize. 4,377,062, Cl. 56-14.300.
Slaughter, Edward R., to United Technologies Corporation. Apparatus for forming alloy powders through solid particle quenching. 4,377,375, Cl. 425-8.000.
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van Tilborg, Wilhelmus J. M.; and Smit, Cornelis J., 4,377,451, Cl. 204-59.00R.
Smith, Bernard T.; Armstrong, Wayne T.; and Nelson, Richard D., to Ford Aerospace and Communication Corporation. Non-uniform thermal imaging detector. 4,377,747, Cl. 250-370.000.
Smith, Donald B. Collapsible binders and the like. 4,377,271, Cl. 248-460.000.
Smith, Grahame N. W., to Goodyear Tire & Rubber Company, The. Pneumatic tire and method for making same. 4,377,193, Cl. 152-354.00R.
Smith, Kenneth L.: *See*—
Task, Harry L.; Genco, Louis V.; Smith, Kenneth L.; and Dabbs, Albert G., 4,377,341, Cl. 356-239.000.
Smith, Oscar W. Mobile voting service. 4,377,367, Cl. 414-545.000.
Smith, Reginald W.: *See*—
Mackay, William B.; and Smith, Reginald W., 4,377,422, Cl. 148-137.000.
Smiths Industries Public Limited Company: *See*—
Beatty, Paul H. J.; and Venn, Bernard R., 4,377,769, Cl. 313-495.000.
SMK Industries: *See*—
Muraji, Takashi; and Kitamura, Hiroshi, 4,377,174, Cl. 132-9.000.
Snedker, Robert, to Seagrams Distillers Limited. Anti-tampering devices for bottles. 4,377,242, Cl. 215-21.000.
Snyder, Keith A.: *See*—
Braun, Roland J.; Carden, Gary R.; and Snyder, Keith A., 4,377,854, Cl. 365-2.000.
S.A. des Etablissements Staubli: *See*—
Froment, Jean-Paul, 4,377,799, Cl. 335-266.000.
Societe Generale des Eaux Minerales de Vittel: *See*—
Gautier, Raoul L. A., 4,377,192, Cl. 150-12.000.
Societe Industrielle Bertrand Faure: *See*—
Bartoli, Michel; Bernard, Armand R.; and Noirot, Daniel, 4,377,609, Cl. 428-71.000.
Societe Nationale d'etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.": *See*—
Porcelli, Gerard, 4,377,370, Cl. 415-9.000.
Societe Nationale Elf Aquitaine (Production): *See*—
Rodot, Francois, 4,377,087, Cl. 73-594.000.
Solmat Systems, Ltd.: *See*—
Assaf, Gad; and Bronicki, Lucien Y., 4,377,071, Cl. 60-641.800.
Solomon, Frank, to Diamond Shamrock Corporation. Gas diffusion electrode and process. 4,377,496, Cl. 252-425.300.
Sommer Co.: *See*—
Sommer, Gordon M., 4,377,222, Cl. 192-0.02R.
Sommer, Gordon M., to Sommer Co. Drive system. 4,377,222, Cl. 192-0.02R.
Sony Corporation: *See*—
Asagi, Osamu; and Sakai, Masaaki, 4,377,777, Cl. 318-68.000.
Sound Engineering (Far East) Limited: *See*—
Kao, Lin, 4,377,808, Cl. 340-527.000.
Sparks, Marshall F.: *See*—
Luther, Ronald B.; Frey, Peter F.; and Sparks, Marshall F., 4,377,165, Cl. 128-214.400.
Speeflo Manufacturing Corporation: *See*—
Levey, Gustave S.; Reeves, Clarence C.; and Owens, Donald R., 4,377,838, Cl. 361-228.000.
Spens, Stephen N.: *See*—
Metcalf, Eric; Woollven, Jack; Spens, Stephen N.; and Kett, Brian L. A., 4,377,782, Cl. 324-52.000.
Sperry Corporation: *See*—
Flannigan, James B.; Emfinger, Jack E.; and Elliott, Thomas R., 4,377,848, Cl. 364-433.000.
Spivey, Paul R.: *See*—
Markham, Harvey R.; and Spivey, Paul R., 4,377,845, Cl. 364-200.000.
Sponseller, David R.; Melby, Earl G.; and Fabris, Hubert J., to General Tire & Rubber Company, The. Curing of polyglycidyl ether resins. 4,377,680, Cl. 528-123.000.
Sprague Electric Company: *See*—
Barry, John E.; Finkelstein, Manuel; and Ross, Sidney D., 4,377,692, Cl. 546-186.000.
Pierpont, Ralph E., 4,377,548, Cl. 264-265.000.
Sprague, Robert W., to United States Borax & Chemical Corporation. Fire retardant polymer compositions containing a borate-sulfate mixture. 4,377,506, Cl. 252-609.000.
Square D Company: *See*—
Schultz, John T.; and Bishop, Clifford F., 4,377,795, Cl. 335-23.000.
Stache, Ulrich; Fritsch, Werner; Alpermann, Hans G.; and Sandow, Jurgen K., to Hoechst Aktiengesellschaft. Corticoid-17-(alkyl carbonates) and process for their manufacture. 4,377,575, Cl. 424-243.000.
Staciokas, Leon J., to Exxon Research & Engineering Co. Linear stepper motor drive with a read/write head in a floppy disc system. 4,377,761, Cl. 310-12.000.
Stacy, Carl W., to Zenith Radio Corporation. Apparatus for eliminating picture bounce in television/telephone system. 4,377,729, Cl. 179-2.0TV.
Stahlwerke Bruninghaus Gesellschaft mit beschrankter Haftung: *See*—
Wienand, Josef; and Beihammer, Horst, 4,377,280, Cl. 267-180.000.
Standard Havens, Inc.: *See*—
Clements, Jack T., 4,377,397, Cl. 55-97.000.
Standard Oil Co., The: *See*—
Grasselli, R. K.; Suresh, D. D.; Zagata, R. J.; and Force, G. E., 4,377,500, Cl. 252-432.000.
Grasselli, Robert K.; Suresh, Dev D.; and Hardman, Harley F., 4,377,534, Cl. 260-465.300.
Pesa, Frederick A.; and Graham, Anne M., 4,377,643, Cl. 518-713.000.
Wu, Hsin C., 4,377,444, Cl. 203-96.000.
Standard Oil Company (Indiana): *See*—
Klotz, Marvin R., 4,377,502, Cl. 252-455.00Z.
Sabol, Albert R.; and Petrellis, Nicolas C., 4,377,527, Cl. 260-429.900.
Weisrock, William P., 4,377,637, Cl. 435-104.000.
York, Earl D., 4,377,465, Cl. 208-11.00R.
Stanford, James R.: *See*—
Seale, Virgil L.; Stanford, James R.; Briscoe, James E.; and Penny, Glenn S., 4,377,710, Cl. 564-281.000.
Star Offshore Services Limited: *See*—
Rolls, George H.; Beveridge, Andrew J.; Challener, Ronald T.; and Stuart, William, 4,377,478, Cl. 210-242.300.
Staron, John C., to Bendix Corporation, The. Chuck assembly and collet. 4,377,292, Cl. 279-46.00R.
Staudt, Wilhelm; and Steier, Hans-Wido, to Electrolux-Sigmund GmbH. Cooling arrangement, particularly for beverages. 4,377,076, Cl. 62-395.000.
Staufer, Adolf, to Fisher Gesellschaft m.b.H. Ski, particularly Alpine ski. 4,377,297, Cl. 280-609.000.
Stauffer Chemical Company: *See*—
Carron, Mark S.; Greco, Carl C.; VanBrocklin, Lester P.; and Via, Francis A., 4,377,559, Cl. 423-317.000.
Stauffer, Norman L., to Honeywell Inc. Low cost auto focus system improvement. 4,377,330, Cl. 354-25.000.
Staver, Peter J. Facial protective device, and methods of constructing and utilizing same. 4,377,162, Cl. 128-200.280.
Steadley Company: *See*—
Schulz, Martin, Jr.; and Bane, James E., 4,377,279, Cl. 267-103.000.
Steffens, James J., to Rhone-Poulenc Agrochimie. Herbicidal derivatives of 5-phenoxy-4(3H)-quinazolinone-1-oxide. 4,377,408, Cl. 71-92.000.
Steidley, John W.: *See*—
Sano, Richard M.; Steidley, John W.; Gillespie, Bruce M.; and Tinkel, Jack B., 4,377,752, Cl. 378-152.000.
Steier, Hans-Wido: *See*—
Staudt, Wilhelm; and Steier, Hans-Wido, 4,377,076, Cl. 62-395.000.
Steiner, Rudolf: *See*—
Herbrechtsmeier, Peter; Schafer, Hans; and Steiner, Rudolf, 4,377,395, Cl. 55-38.000.
Sterling Drug Inc.: *See*—
Crounse, Nathan N.; and Schmidt, Paul J., 4,377,698, Cl. 548-455.000.
Lesher, George Y.; and Page, Donald F., 4,377,585, Cl. 424-263.000.
Sternfeld, Hans J.; Reinkenhof, Josef; and Lambrecht, Heinrich, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt. Steam generator. 4,377,067, Cl. 60-39.550.
Stiftung Deutsches Krebsforschungszentrum: *See*—
Eisenbrand, Gerhard, 4,377,687, Cl. 544-164.000.
Stingl, Hans A., to Toms River Chemical Corporation. Navy blue water-soluble sulfophenyl- or sulfonaphthyl-azo-1,4-phenylene-azo-5-(8-anilinonaphthalene-1-sulfonic acid) dyes for polyamides. 4,377,519, Cl. 260-190.000.
Stoll, Brigitte: *See*—
Lautenschlager, Hans-Heiner; Betzing, Hans; Stoll, Brigitte; and Probst, Manfred, 4,377,695, Cl. 548-305.000.
Stolle Corporation, The: *See*—
Kaminski, Elton G., 4,377,084, Cl. 72-325.000.
Strandwitz, Peter: *See*—
McMillin, John R.; and Strandwitz, Peter, 4,377,246, Cl. 222-56.000.
Street, Sidney W.; and Beckley, Don A., to HITCO. Bis-maleimide resin/divinyl arylene composites. 4,377,657, Cl. 524-424.000.
Streich, Martin: *See*—
Pocrnja, Anton; and Streich, Martin, 4,377,073, Cl. 60-693.000.
Streicher, Rolf: *See*—
Hahn, Erwin; Lach, Dietrich; Schneider, Kurt; Strickler, Rainer; and Streicher, Rolf, 4,377,387, Cl. 8-94.170.
Strickler, Rainer: *See*—
Hahn, Erwin; Lach, Dietrich; Schneider, Kurt; Strickler, Rainer; and Streicher, Rolf, 4,377,387, Cl. 8-94.170.
Strobel, Gary A., to Research and Development Institute, Inc. at Montana State University. Methods for treating Dutch elm disease. 4,377,571, Cl. 424-93.000.
Strohbeen, Irene B.; and Dinius, James H., to Kimberly-Clark Corporation. Strength and softness control of dry formed sheets. 4,377,543, Cl. 264-120.000.

Strowe, Robert J.: *See*—
Simon, Donald R.; and Strowe, Robert J., 4,377,049, Cl. 40-465.000.
Struve, Friedrich, to Gundle Holdings (Proprietary) Limited. Welding of plastics material. 4,377,429, Cl. 156-153.000.
Stuart, William: *See*—
Rolls, George H.; Beveridge, Andrew J.; Challener, Ronald T.; and Stuart, William, 4,377,478, Cl. 210-242.300.
Stucki, Frank F.: *See*—
Brekka, Thomas T.; and Stucki, Frank F., 4,377,741, Cl. 235-472.000.
Stull, Morton B. Dispensing cap construction. 4,377,248, Cl. 222-543.000.
Sturges, Robert H., Jr.: *See*—
Wilks, Robert S.; and Sturges, Robert H., Jr., 4,377,238, Cl. 209-587.000.
Stutzman, Carl. Wind turbine. 4,377,372, Cl. 416-117.000.
Sudjian, Mary, to Nannette Manufacturing Company, Inc. Convertible length garment. 4,377,007, Cl. 2-105.000.
Sugawa, Kazuo: *See*—
Miyashita, Kiyoshi; Takizawa, Tatuo; Sugawa, Kazuo; and Nishikawa, Masaji, 4,377,229, Cl. 198-494.000.
Sugawara, Shinichi: *See*—
Hiraoka, Tetsuo; Kobayashi, Takeo; Ishida, Noboru; and Sugawara, Shinichi, 4,377,591, Cl. 424-274.000.
Sugawara, Toru: *See*—
Amano, Matsuo; Sugawara, Toru; Mouri, Yasunori; Aochi, Yoshikazu; and Sakamoto, Shinichi, 4,377,137, Cl. 123-179.00B.
Sugimoto, Kaname; and Hayashibara, Yasushi, to Hayashibara, Ken; and Ashida, Shin. Process for the production of human erythropoietin. 4,377,513, Cl. 26-112.00R.
Sugino, Takashi; Wada, Masaru; Shimizu, Hirokazu; and Itoh, Kunio, to Matsushita Electric Industrial Co., Ltd. Semiconductor laser. 4,377,865, Cl. 372-45.000.
Sugishima, Kenji: *See*—
Goto, Hiroshi; and Sugishima, Kenji, 4,377,031, Cl. 29-576.00B.
Sugiura, Yoshinori: *See*—
Tsuji, Takao; Ichikawa, Junji; Ichihashi, Hiroo; Sugiura, Yoshinori; Nakano, Takashi; and Hirayama, Kazuhiro, 4,377,333, Cl. 355-3.0SH.
Sugiyama, Hiroshi: *See*—
Shirakawa, Norio; Tomioka, Hiromi; Koizumi, Masuo; Takeuchi, Masaki; Sugiyama, Hiroshi; Okada, Masanori; Yoshimoto, Masahiro; Iwane, Yoshitaka; and Murakami, Yasushi, 4,377,407, Cl. 71-76.000.
Sulprizio, Michael S. Tennis racket. 4,377,288, Cl. 273-73.00D.
Sumitani, Koji: *See*—
Sato, Kimihiko; Sakai, Tokuji; Yamasaki, Yasuo; Onodera, Tamio; and Sumitani, Koji, 4,377,718, Cl. 585-467.000.
Sumitomo Chemical Company, Limited: *See*—
Shiraishi, Yoshihisa; Nakagawa, Kazuhiro; Nakata, Chiaki; and Ohasi, Koiti, 4,377,490, Cl. 252-188.30R.
Sunbeam Plastics Corporation: *See*—
Montgomery, Gary V., 4,377,236, Cl. 206-540.000.
Sundmar, Goran: *See*—
Gustavsson, Olle; and Sundmar, Goran, 4,377,104, Cl. 89-45.000.
Suresh, D. D.: *See*—
Grasselli, R. K.; Suresh, D. D.; Zagata, R. J.; and Force, G. E., 4,377,500, Cl. 252-432.000.
Suresh, Dev D.: *See*—
Grasselli, Robert K.; Suresh, Dev D.; and Hardman, Harley F., 4,377,534, Cl. 260-465.300.
Suzuki, Migaku; and Igaue, Takamitsu, to Uni-Charm Corporation. Nonwoven fabrics and method of producing the same. 4,377,615, Cl. 428-213.000.
Suzuki, Nobuhiko: *See*—
Takagi, Susumu; and Suzuki, Nobuhiko, 4,377,048, Cl. 40-367.000.
Suzuki, Ryo: *See*—
Tsuchihashi, Michihiro; Suzuki, Ryo; Watanabe, Keiji; and Saito, Masato, 4,377,772, Cl. 315-63.000.
Suzuki, Shigeru: *See*—
Fukuma, Daizo; Suzuki, Shigeru; Shirota, Kensho; and Harada, Kunihiro, 4,377,678, Cl. 528-75.000.
Suzuki, Tadashi: *See*—
Ikeda, Masaki; Nishino, Atsushi; and Suzuki, Tadashi, 4,377,618, Cl. 428-323.000.
Suzuki, Yoshiharu, to Matsushita Electric Works, Ltd. Synchronous data transmission system utilizing AC power line. 4,377,804, Cl. 340-310.00A.
Svenning, Bengt F. S.: *See*—
Johansson, Folke L.; and Svenning, Bengt F. S., 4,377,183, Cl. 137-606.000.
Swedlow, Inc.: *See*—
Fischer, William F.; and Bailey, Charles A., II, 4,377,611, Cl. 428-192.000.
Sweeney, Nevin J.; and Seale, Kenneth C., to K. H. Freeman Pty. Ltd. Wax compositions. 4,377,649, Cl. 524-49.000.
Sweeney, Richard F.: *See*—
Anello, Louis G.; and Sweeney, Richard F., 4,377,716, Cl. 570-153.000.
Anello, Louis G.; and Sweeney, Richard F., 4,377,717, Cl. 570-172.000.
Swicker, Donald B.: *See*—
Sautter, Helmuth O.; and Swicker, Donald B., 4,377,821, Cl. 358-133.000.
Syglo International S.A.: *See*—
Bruneel, Robert, 4,377,253, Cl. 494-38.000.
Sylwester, Ronald D.: *See*—
Faber, Robert V.; and Sylwester, Ronald D., 4,377,275, Cl. 256-69.000.
Szente, Andre: *See*—
Branca, Quirico; Fischli, Albert E.; and Szente, Andre, 4,377,522, Cl. 260-239.30D.
Tagliabue, Vittorio: *See*—
Canavesi, Roberto; Ghezzi, Roberto; and Tagliabue, Vittorio, 4,377,491, Cl. 252-441.000.
Taig, Alistair G., to Bendix Corporation, The. Method for finish forming thermoplastic surfaces. 4,377,549, Cl. 264-320.000.
Takada, Sbunji: *See*—
Mifune, Hiroyuki; Takada, Sbunji; Akimura, Yoshitaka; and Fuseya, Yoshiharu, 4,377,634, Cl. 430-440.000.
Takagi, Susumu; and Suzuki, Nobuhiko, to Alps Electric Co., Ltd. Display retaining means assembly. 4,377,048, Cl. 40-367.000.
Takahashi, Jun, to NHK Spring Co., Ltd. Resilient hinge with coil spring on pintle. 4,377,019, Cl. 16-307.000.
Takahashi, Kibei; Terada, Seiko; and Shimono, Muchiji, to Yoshida Kogyo K. K. Harness frame for looms. 4,377,189, Cl. 139-35.000.
Takahashi, Masayuki: *See*—
Ohhata, Michinobu; Matsumura, Toshihiko; Yamasawa, Masao; Chujo, Takafumi; and Takahashi, Masayuki, 4,377,759, Cl. 307-491.000.
Takahashi, Noriyoshi: *See*—
Saito, Toshio; Ito, Motoya; Takahashi, Noriyoshi; and Sato, Masaki, 4,377,784, Cl. 324-158.0MG.
Takahashi, Yukiharu, to Tokyo Shibaura Denki Kabushiki Kaisha. Injector driving circuit. 4,377,144, Cl. 123-490.000.
Takami, Toshiji; Ito, Toshio; and Kawaguchi, Fusako, to Mitsubishi Denki Kabushiki Kaisha. Flying object. 4,377,265, Cl. 244-153.00R.
Takano, Hirozo: *See*—
Mashiko, Yoji; Takano, Hirozo; Abe, Haruhiko; Asai, Sotoju; Mizuguchi, Kazuo; and Nomoto, Sumio, 4,377,734, Cl. 219-121.0PE.
Takata, Terasu; Hangai, Makoto; and Yokoyama, Yasuo, to Ogura Clutch Co., Ltd. Clutch brake assembly. 4,377,224, Cl. 192-18.00R.
Takeuchi, Hideaki: *See*—
Yoshida, Satoshi; Takeuchi, Hideaki; Shigyo, Masamichi; Iijima, Toshio; and Ikeda, Tomoaki, 4,377,607, Cl. 427-250.000.
Takeuchi, Masaki: *See*—
Shirakawa, Norio; Tomioka, Hiromi; Koizumi, Masuo; Takeuchi, Masaki; Sugiyama, Hiroshi; Okada, Masanori; Yoshimoto, Masahiro; Iwane, Yoshitaka; and Murakami, Yasushi, 4,377,407, Cl. 71-76.000.
Takinami, Iwao: *See*—
Hoshikawa, Takeshi; and Takinami, Iwao, 4,377,404, Cl. 65-59.220.
Takita, Hitoshi; Mukaida, Yutaka; Noda, Sakuo; and Kobayashi, Hidetoshi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Derivative of 4-(N-(substituted-benzylidene)amino-methyl cyclohexane-1-carboxylic acid. 4,377,594, Cl. 424-309.000.
Takizawa, Tatuo: *See*—
Miyashita, Kiyoshi; Takizawa, Tatuo; Sugawa, Kazuo; and Nishikawa, Masaji, 4,377,229, Cl. 198-494.000.
Tamura, Masao: *See*—
Wada, Yasuo; Ikeda, Takahide; and Tamura, Masao, 4,377,421, Cl. 148-1.500.
Tamura, Yasuyuki, to Canon Kabushiki Kaisha. Developing device. 4,377,332, Cl. 355-3.0DD.
Tancredi, Henry J.: *See*—
Del Bianco, Matthew A.; and Tancredi, Henry J., 4,377,434, Cl. 156-364.000.
Tandler, Peter: *See*—
Schopper, Bernd; Tandler, Peter; and Lowe, Derek, 4,377,176, Cl. 137-493.200.
Taoka Chemical Co., Ltd.: *See*—
Shiraishi, Yoshihisa; Nakagawa, Kazuhiro; Nakata, Chiaki; and Ohasi, Koiti, 4,377,490, Cl. 252-188.30R.
Tappe, Wilhelm: *See*—
Kopineck, H. J.; and Tappe, Wilhelm, 4,377,746, Cl. 250-359.100.
Tarumi, Noriyoshi; Kimura, Kiyoshi; and Iwahashi, Haruo, to Konishiroku Photo Industry Co., Ltd. Layered charge carrier member and method of forming image using same. 4,377,629, Cl. 430-62.000.
Task, Harry L.; Genco, Louis V.; Smith, Kenneth L.; and Dabbs, Albert G., to United States of America, Air Force. System for measuring angular deviation in a transparency. 4,377,341, Cl. 356-239.000.
Tate, Kazuhiko: *See*—
Yamashita, Kasane; Ikehata, Takao; Tate, Kazuhiko; and Nakahara, Keisuke, 4,377,483, Cl. 210-670.000.
Tatsumi, Hideo; Kanamaru, Hisanobu; Tohkairin, Akira; Okabe, Moisei; and Kasama, Ryoji, to Hitachi, Ltd. Rotary electric machine rotor and a method of manufacturing the same. 4,377,762, Cl. 310-42.000.
Tatsushi, Asakawa; and Shinji, Morozumi, to Kabushiki Kaisha Suwa Seikosha. Selectively adjustable voltage detection integrated circuit. 4,377,781, Cl. 323-299.000.
Taufen, Paul M., to Texasgulf Inc. Sulphur gas geochemical prospecting. 4,377,640, Cl. 436-32.000.
Taylor, David E. M.: *See*—
Fydelor, Peter J.; and Taylor, David E. M., 4,377,010, Cl. 3-1.400.
Taylor, Frederick J. Spring actuated piston pump. 4,377,374, Cl. 417-228.000.
Taylor, Gary N.; and Venkatesan, Thirumalai N. C., to Bell Telephone Laboratories, Incorporated. Device lithography by selective ion implantation. 4,377,437, Cl. 156-628.000.

Taylor, James C. Device and method for the measurement of the thickness of a wet coating. 4,377,037, Cl. 33-169.00F.

Taylor, Otis C.: *See*—
Baker, Richard F.; and Taylor, Otis C., 4,377,462, Cl. 204-253.000.

Teijin Petrochemical Industries Ltd.: *See*—
Sato, Kimihiko; Sakai, Tokuji; Yamasaki, Yasuo; Onodera, Tamio; and Sumitani, Koji, 4,377,718, Cl. 585-467.000.

Telmec Co., Ltd.: *See*—
Imahashi, Issei, 4,377,028, Cl. 29-574.000.

Temnikov, Anatoly L: *See*—
Gubin, Ivan P.; Machavariani, Sergei G.; Efremovtsev, Nikolai S.; Kovalenko, Viktor A.; Mozolev, Alexandr V.; Nikolaev, Sergei I.; Nikolaev, Georgy I.; Guriyanov, Viktor A.; Temnikov, Anatoly I.; Tyryshkin, Evgeny E.; Dubynin, Nikolai G.; Kogan, Volf Z.; Ljubkin, Anatoly P.; and Sedko, Anatoly P., 4,377,310, Cl. 299-13.000.

Temple, Chester S., to PPG Industries, Inc. Aqueous peroxide emulsion for use with glass fibers. 4,377,498, Cl. 252-431.00C.

Tenisci, Anthony: *See*—
Jesernig, Rudolph W.; and Tenisci, Anthony, 4,377,281, Cl. 272-120.000.

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Herpers, Ferdinand J.; Kroll, Harley E.; Carlson, Alfred D.; and Dodge, Paul D., 4,377,017, Cl. 15-320.000.

Tennessee Valley Authority: *See*—
Achorn, Frank P.; and McGill, Kenneth E., 4,377,406, Cl. 71-36.000.

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Takahashi, Kihei; Terada, Seiko; and Shimono, Muchiji, 4,377,189, Cl. 139-35.000.

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TEX Innovation AB: *See*—
Olson, Jan C. H.; and Carlson, Karl G., 4,377,061, Cl. 53-433.000.

Texaco Development Corp.: *See*—
Koog, Wolfgang; and Guptill, Frank E., Jr., 4,377,132, Cl. 122-7.00R.
Muenger, James R.; Child, Edward T.; and Brent, Albert, 4,377,394, Cl. 48-62.00R.

Texas Instruments Incorporated: *See*—
Kuo, Chang-Kiang; and Tsaur, Shyh-Chang, 4,377,818, Cl. 357-23.000.
Thompson, E. Earle, 4,377,852, Cl. 364-900.000.

Texasgulf Inc.: *See*—
Taufen, Paul M., 4,377,640, Cl. 436-32.000.

Thaler, Helmut: *See*—
Lenz, Hartmut; and Thaler, Helmut, 4,377,766, Cl. 313-244.000.

Theilenberg, Franz: *See*—
Mayer, Georg; and Theilenberg, Franz, 4,377,442, Cl. 202-263.000.

Theodor Wuppermann GmbH: *See*—
Preller, Hans, 4,377,732, Cl. 219-10.430.

Thiokol Corporation: *See*—
Schmidle, Claude J., 4,377,679, Cl. 528-75.000.

Thomas, John A.; Jones, David L.; and **Ettel, Victor A.,** to United States of America, Interior. Chromium recovery from superalloy scrap by selective chlorine leaching. 4,377,410, Cl. 75-112.000.

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Benoit-Gonin, Roger; Berger, Jean-Luc; Fontanes, Sylvain; and Picquendar, Jean-Edgar, 4,377,760, Cl. 307-530.000.
Fleury, Georges, 4,377,770, Cl. 315-3.600.

Thompson, David R., to Pico Electronics Limited. Switching circuit for a remote control system. 4,377,754, Cl. 307-114.000.

Thompson, E. Earle, to Texas Instruments Incorporated. Terminal emulator. 4,377,852, Cl. 364-900.000.

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Thomson, Barry South: *See*—
Bexley, Robert G.; and Thomson, Barry South, 4,377,430, Cl. 156-184.000.

Tickle, Andrew C., to Fairchild Camera & Instrument. Electrically erasable programmable read-only memory. 4,377,857, Cl. 365-185.000.

Tiefel, Thomas H.: *See*—
Jin, Sungho; and Tiefel, Thomas H., 4,377,797, Cl. 335-153.000.

Tinchon, Lucien, to Houilleres Du Bassin de Lorraine. Device for projecting a wall coating, particularly for an excavation. 4,377,127, Cl. 118-306.000.

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Sano, Richard M.; Steidley, John W.; Gillespie, Bruce M.; and Tinkel, Jack B., 4,377,752, Cl. 378-152.000.

Tipton, John P.: *See*—
Daunt, John E.; Tipton, John P.; and Adair, John E., 4,377,736, Cl. 219-121.0LH.

Tohkairin, Akira: *See*—
Tatsumi, Hideo; Kanamaru, Hisanobu; Tohkairin, Akira; Okabe, Moisei; and Kasama, Ryoji, 4,377,762, Cl. 310-42.000.

Tokarz, Richard D., to United States of America, Energy. High temperature liquid level sensor. 4,377,550, Cl. 376-245.000.

Tokuse, Masahiro: *See*—
Iwai, Tadashi; Kawahito, Takashi; and Tokuse, Masahiro, 4,377,677, Cl. 528-35.000.

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Moriya, Takahiko; Hazuki, Yoshikazu; and Kashiwagi, Masahiro, 4,377,438, Cl. 156-643.000.
Ozawa, Osamu, 4,377,029, Cl. 29-576.00B.
Sakaue, Tatsuo; and Sato, Chikara, 4,377,794, Cl. 333-165.000.
Seimiya, Motoo, 4,377,563, Cl. 423-345.000.
Takahashi, Yukiharu, 4,377,144, Cl. 123-490.000.

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Tomozawa, Akihiro: *See*—
Sakai, Yoshio; Masuhara, Toshiaki; Minato, Osamu; Sasaki, Toshio; Katto, Hisao; Hashimoto, Norikazu; Muramatsu, Shin-ichi; and Tomozawa, Akihiro, 4,377,819, Cl. 357-59.000.

Toms River Chemical Corporation: *See*—
Stingl, Hans A., 4,377,519, Cl. 260-190.000.

Toney, John J.; and **Brown, Leland T.,** to Motorola, Inc. Voltage transient suppressor circuit. 4,377,832, Cl. 361-56.000.

Tonomura, Toshiya; and **Nishiuma, Saburo,** to Sharp Kabushiki Kaisha. Solar energy collector assembly. 4,377,155, Cl. 126-443.000.

Toth, Leslie, to Branson Ultrasonics Corporation. Method of friction welding. 4,377,428, Cl. 156-73.500.

Toukhy, Medhat A.; and **Klawansky, Leo,** to Philip A. Hunt Chemical Corporation. Positive novolak photoresist compositions. 4,377,631, Cl. 430-192.000.

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Masakatsu, Ohguchi; Shizuki, Tatsuhiko; and Kashihara, Takao, 4,377,682, Cl. 528-301.000.

Toyo Soda Manufacturing Co., Ltd.: *See*—
Hiraga, Yoichi; and Watanabe, Osamu, 4,377,562, Cl. 423-321.00S.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Ishida, Yasuhiko, 4,377,148, Cl. 123-549.000.
Ueno, Yoshiki; Kawabata, Takakazu; Hattori, Tadashi; and Miura, Kazuhiko, 4,377,785, Cl. 324-378.000.
Uga, Kozo, 4,377,740, Cl. 377-2.000.

Treiber, Robert, to International Telephone and Telegraph Corporation. Digital two-to-four wire converter for full duplex signals. 4,377,858, Cl. 370-24.000.

Trenbeath, Steven L.; Feldman, Allan M.; and **Nummy, Laurence J.,** to American Cyanamid Company. Manufacture of isocyanates. 4,377,530, Cl. 260-453.00P.

Tsatsas, Georges; Costakis, Evan E.; and **Foscolos, Georges V.,** to Etablissements Nativelle S.A. Process for preparing spiro derivatives. 4,377,689, Cl. 546-15.000.

Tsaur, Shyh-Chang: *See*—
Kuo, Chang-Kiang; and Tsaur, Shyh-Chang, 4,377,818, Cl. 357-23.000.

Tse, Harold F., to Engelhard Corporation. Regeneration of sulfur-contaminated platinum-alumina catalyst. 4,377,495, Cl. 252-415.000.

Tsuchihashi, Michihiro; Suzuki, Ryo; Watanabe, Keiji; and **Saito, Masato,** to Mitsubishi Denki Kabushiki Kaisha. Discharge lamp and lighting equipment. 4,377,772, Cl. 315-63.000.

Tsuhako, Parker I., to Ohline Corporation. Tilt and lift mechanism for venetian blind. 4,377,194, Cl. 160-168.00R.

Tsuji, Takao; Ichikawa, Junji; Ichihashi, Hiroo; Sugiura, Yoshinori; Nakano, Takashi; and **Hirayama, Kazuhiro,** to Canon Kabushiki Kaisha. Recording apparatus. 4,377,333, Cl. 355-3.0SH.

Tubeco, Inc.: *See*—
Katz, Lyber, 4,377,185, Cl. 138-90.000.

Tuck, Lee; and **Skraba, Frank W.,** to Phillips Petroleum Company. Control of a fractional distillation process. 4,377,443, Cl. 203-1.000.

Tucker, Kenneth W.: *See*—
Joo, Louis A.; Tucker, Kenneth W.; and Webb, Scott D., 4,377,463, Cl. 204-294.000.

Tuller, Jay E. Rotatable hair brush. 4,377,013, Cl. 15-25.000.

Tyryshkin, Evgeny E.: *See*—
Gubin, Ivan P.; Machavariani, Sergei G.; Efremovtsev, Nikolai S.; Kovalenko, Viktor A.; Mozolev, Alexandr V.; Nikolaev, Sergei I.; Nikolaev, Georgy I.; Guriyanov, Viktor A.; Temnikov, Anatoly I.; Tyryshkin, Evgeny E.; Dubynin, Nikolai G.; Kogan, Volf Z.; Ljubkin, Anatoly P.; and Sedko, Anatoly P., 4,377,310, Cl. 299-13.000.

Ube Industries, Ltd.: *See*—
Iwai, Tadashi; Kawahito, Takashi; and Tokuse, Masahiro, 4,377,677, Cl. 528-35.000.

Uchino, Shoichi: *See*—
Morishita, Hajime; Kohashi, Takahiro; Nonogaki, Saburo; Akagi, Motoo; Hayashi, Nobuaki; and Uchino, Shoichi, 4,377,630, Cl. 430-176.000.

Udren, Eric A., to Electric Power Research Institute, Inc. Methods and apparatus for protecting electrical reactors. 4,377,833, Cl. 361-79.000.

Ueda, Ikuo; Kato, Masayuki; and **Nagano, Masanobu,** to Fujisawa Pharmaceutical Co., Ltd. Tricyclic quinazoline derivatives. 4,377,580, Cl. 424-251.000.

Uehlinger, Hanspeter: *See*—
Mislin, Roland; Uehlinger, Hanspeter; and Oppliger, Max, 4,377,517, Cl. 260-153.000.

Ueno, Kenzo, to Nissan Motor Co., Ltd. Vibration damping bushing. 4,377,216, Cl. 180-73.0TL.
Ueno, Yoshiki; Kawabata, Takakazu; Hattori, Tadashi; and Miura, Kazuhiko, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Device for diagnosing ignition system for use in internal combustion engine. 4,377,785, Cl. 324-378.000.
Uga, Kozo, to Toyota Jidosha Kogyo Kabushiki Kaisha; Nippondenso Co., Ltd.; and Jeco Co., Ltd. Initializing circuit arrangement for a counter circuit. 4,377,740, Cl. 377-2.000.
Ukigaya, Fumio: *See*—
Kikuoka, Takao; Yamamoto, Hiroaki; Sasaki, Noriyoshi; Wakui, Kotaro; Murakami, Keinosuke; Ohnishi, Kazunori; Kawamura, Gou; Noguchi, Hiroshi; and Ukigaya, Fumio, 4,377,787, Cl. 324-431.000.
Ulshafer, Carl, Jr. Hitching apparatus. 4,377,296, Cl. 280-425.00R.
Uni-Charm Corporation: *See*—
Suzuki, Migaku; and Igaue, Takamitsu, 4,377,615, Cl. 428-213.000.
Union Carbide Corporation: *See*—
Chiu, Herman S., 4,377,187, Cl. 138-118.100.
Chiu, Herman S., 4,377,606, Cl. 427-172.000.
Union Special Corporation: *See*—
Boser, Ronald J.; and Watts, Henry J., 4,377,122, Cl. 112-265.100.
United American Car Co.: *See*—
Hallam, Keith J.; and Marulic, Walter J., 4,377,058, Cl. 52-45.000.
United Cement Co.: *See*—
Maul, Peter L.; and Robertson, Albert E., 4,377,416, Cl. 106-98.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Fydelor, Peter J.; and Taylor, David E. M., 4,377,010, Cl. 3-1.400.
United States Borax & Chemical Corporation: *See*—
Sprague, Robert W., 4,377,506, Cl. 252-609.000.
United States Gypsum Company: *See*—
Kuhr, Albert F., 4,377,059, Cl. 52-98.000.
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Agriculture: *See*—
Feuge, Reuben O.; and Zeringue, Hampden J., Jr., 4,377,686, Cl. 536-119.000.
Peterson, Donald L., 4,377,064, Cl. 56-328.00R.
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Albertini, Francis G., 4,377,291, Cl. 277-105.000.
Dee, Louis A.; and Fiske, Mary E., 4,377,641, Cl. 436-178.000.
Helminiak, Thaddeus E.; Benner, Charles L.; Arnold, Fred E.; and Husman, George, 4,377,546, Cl. 264-232.000.
Jensen, William E., 4,377,755, Cl. 377-63.000.
Kuperman, Gilbert G.; and Lewis, Donald E., 4,377,824, Cl. 360-10.300.
Task, Harry L.; Genco, Louis V.; Smith, Kenneth L.; and Dabbs, Albert G., 4,377,341, Cl. 356-239.000.
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Kronenberg, Stanley; Levine, Harry; McLaughlin, William L.; and Siebentritt, Carl R., 4,377,751, Cl. 250-474.100.
Energy: *See*—
Hershcovitch, Ady; and Prelec, Krsto, 4,377,773, Cl. 315-111.810.
Korenko, Michael K., 4,377,553, Cl. 420-584.000.
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Wilks, Robert S.; and Sturges, Robert H., Jr., 4,377,238, Cl. 209-587.000.
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Golben, Peter M., 4,377,209, Cl. 169-26.000.
Schiffbauer, William H.; and Watson, Richard A., 4,377,726, Cl. 179-1.00H.
Thomas, John A.; Jones, David L.; and Ettel, Victor A., 4,377,410, Cl. 75-112.000.
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Shanks, George C. Compression test apparatus. 4,377,089, Cl. 73-818.000.
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Belew, Robert R.; and Boehme, Richard J., 4,377,266, Cl. 244-159.000.
Monson, Daryl J., 4,377,343, Cl. 356-357.000.
Wisander, Donald W.; and Bill, Robert C., 4,377,371, Cl. 415-174.000.
Navy: *See*—
Freeman, Elzie H., 4,377,807, Cl. 340-347.00P.
Haynes, Harvey H.; and Rail, Robert D., 4,377,509, Cl. 252-633.000.
Kovalenko, Gerald E., 4,377,103, Cl. 89-1.50R.
McLandrich, Matthew N., 4,377,403, Cl. 65-3.110.
Mocenter, Michael E.; and Koper, Harry F., 4,377,744, Cl. 250-231.0SE.
U.S. Philips Corporation: *See*—
van Vliet, Johannes A. J. M., 4,377,771, Cl. 315-047.000.
Vinton, David J., 4,377,627, Cl. 430-22.000.
U.S. Product Development Company: *See*—
Adell, Robert, 4,377,056, Cl. 49-462.000.
United Technologies Corporation: *See*—
Granatek, Bronislaw J.; and Hall, Lawrence D., 4,377,420, Cl. 134-2.000.
Slaughter, Edward R., 4,377,375, Cl. 425-8.000.
University of Delaware, The: *See*—
Dalal, Vikram L., 4,377,723, Cl. 136-249.000.
University of Georgia Research Foundation, Inc.: *See*—
Cormier, Milton J., 4,377,577, Cl. 424-247.000.
University of Toledo: *See*—
Lee, Harold H., 4,377,639, Cl. 435-285.000.
University Patents, Inc.: *See*—
Bryant, Marvin P.; and Genthner, Barbara R. S., 4,377,638, Cl. 435-136.000.
Upjohn Company, The: *See*—
Skaletzky, Louis L., 4,377,586, Cl. 424-266.000.
Usunami, Shoichi: *See*—
Sakakiyama, Ryuzo; and Usunami, Shoichi, 4,377,223, Cl. 192-3.580.
Vadas, Leslie; and Sabo, Bert M. Dual plunger dental amalgam dispenser. 4,377,380, Cl. 433-89.000.
Vale, Wylie W., Jr.: *See*—
Rivier, Catherine L.; Rivier, Jean E. F.; and Vale, Wylie W., Jr., 4,377,574, Cl. 424-177.000.
Valentine, John W.: *See*—
Commetie, Denis S.; and Valentine, John W., 4,377,256, Cl. 239-117.000.
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Friedman, Ernest H.; Flammer, Charles N.; Baker, Daniel A.; and Vamvakas, Spiro, 4,377,158, Cl. 128-1.00R.
VanBrocklin, Lester P.: *See*—
Carron, Mark S.; Greco, Carl C.; VanBrocklin, Lester P.; and Via, Francis A., 4,377,559, Cl. 423-317.000.
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Vandenberg, August; Vandenberg, Ben W.; Vandenberg, Andrew W.; and Haws, Ben E., 4,377,131, Cl. 119-148.000.
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Vandenberg, August; Vandenberg, Ben W.; Vandenberg, Andrew W.; and Haws, Ben E., 4,377,131, Cl. 119-148.000.
Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. Th., to Janssen Pharmaceutica, N.V. Piperazine derivatives. 4,377,578, Cl. 424-250.000.
Vandenput, Pierre F.: *See*—
DeMeester, Philippe A.; Heraly, Jean-Pierre J.; and Vandenput, Pierre F., 4,377,456, Cl. 204-109.000.
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Elliott, Guy R. B.; Vanderborgh, Nicholas E.; and McDaniel, Milton W., 4,377,208, Cl. 166-265.000.
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van Tilborg, Wilhelmus J. M.; and Smit, Cornelis J., to Shell Oil Company. Electrochemical conversion of conjugated dienes into alkadienedioic acids. 4,377,451, Cl. 204-59.00R.
van Vliet, Johannes A. J. M., to U.S. Philips Corporation. Glow-discharge starter. 4,377,771, Cl. 315-047.000.
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Bryson, John D., 4,377,399, Cl. 55-226.000.
Veber, Daniel F.; and Freidinger, Roger M., to Merck & Co., Inc. Long lasting agonists and antagonists of LH-RH. 4,377,515, Cl. 260-112.5LH.
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Kang, Kenneth S.; and Veeder, George T., 4,377,636, Cl. 435-101.000.
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Buschmann, John C.; Rasmussen, Elizabeth L.; Webster, William C.; and Veltman, Preston L., 4,377,414, Cl. 106-85.000.
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Venkatesan, Thirumalai N. C.: *See*—
Taylor, Gary N.; and Venkatesan, Thirumalai N. C., 4,377,437, Cl. 156-628.000.
Venn, Bernard R.: *See*—
Beatty, Paul H. J.; and Venn, Bernard R., 4,377,769, Cl. 313-495.000.
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Henning, Hans-Georg; and Sebert, Wolfgang, 4,377,815, Cl. 346-140.00R.
Versatile Cornat Corporation: *See*—
Lenton, Kenneth G., 4,377,126, Cl. 118-47.000.
Vetter, Manfred. Plug. 4,377,184, Cl. 138-89.000.
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Carron, Mark S.; Greco, Carl C.; VanBrocklin, Lester P.; and Via, Francis A., 4,377,559, Cl. 423-317.000.
Viehe, John S. Improved rotary scraper having flexible fingers. 4,377,412, Cl. 15-236.00C.
Vigo, Gilles, to Compagnie Industrielle de Mecanismes. Bi-rotational hinge. 4,377,020, Cl. 16-329.000.
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Kadlic, Thomas P., 4,377,285, Cl. 273-148.00A.
Vinton, David J., to U.S. Philips Corporation. Microminiature solid state device manufacture with automatic alignment of sub-patterns. 4,377,627, Cl. 430-22.000.
Vives, Van C.; and Brady, Donnie G., to Phillips Petroleum Company. Molded polymer treatment. 4,377,660, Cl. 524-494.000.
Vogel, Axel: *See*—
Kaiser, Reinhard; Behre, Horst; Dammann, Jurgen; Putter, Rolf; and Vogel, Axel, 4,377,535, Cl. 260-505.00C.

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Harms, Wolfgang; Wunderlich, Klaus; and von Oertzen, Klaus, 4,377,688, Cl. 544-189.000.

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Niermeijer, Anton G. A., 4,377,016, Cl. 15-215.000.

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McDermott, Richard P.; and Brown, Ernest J., 4,377,085, Cl. 72-359.000.

W. R. Grace & Co.: *See—*
Allen, Howard L., 4,377,472, Cl. 209-166.000.
Guthrie, James L.; and Arquette, Suze E., 4,377,645, Cl. 521-137.000.

Wacker Chemie GmbH: *See—*
Geschonke, Hans; Goetze, Ulrich; and Kreilein, Kurt, 4,377,672, Cl. 526-203.000.
Merz, Ekkehard; and Singer, Robert, 4,377,433, Cl. 156-326.000.

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Sugino, Takashi; Wada, Masaru; Shimizu, Hirokazu; and Itoh, Kunio, 4,377,865, Cl. 372-45.000.

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Ikei, Akira; Akahama, Motoharu; Wada, Tokisuke; and Onogi, Takashi, 4,377,617, Cl. 428-214.000.

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Wada, Yoshihiro, to Sharp Kabushiki Kaisha. Electronic thermometer. 4,377,171, Cl. 128-736.000.

Wafer, John A.: *See—*
Matsko, Joseph J.; and Wafer, John A., 4,377,837, Cl. 361-105.000.

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Waitkus, Phillip A.; and D'Alelio, Gaetano F., to Plastics Engineering Company. Polyamide derivatives having unsaturated terminal amic acid groups. 4,377,536, Cl. 260-544.00N.

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Rico, Isabelle; and Wakselman, Claude, 4,377,711, Cl. 568-588.000.

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Kikuoka, Takao; Yamamoto, Hiroaki; Sasaki, Noriyoshi; Wakui, Kotaro; Murakami, Keinosuke; Ohnishi, Kazunori; Kawamura, Gou; Noguchi, Hiroshi; and Ukigaya, Fumio, 4,377,787, Cl. 324-431.000.

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LaVanture, Mark D.; and Walker, George L., 4,377,561, Cl. 423-321.00R.

Wallach, Ronald M.: *See—*
Rzasa, Ronald P.; and Wallach, Ronald M., 4,377,168, Cl. 128-303.100.

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Rzasa, Ronald P.; and Wallach, Ronald M., 4,377,168, Cl. 128-303.100.

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Watanabe, Hideo, to Yokohama Rubber Co., Ltd., The. Ultraviolet-curing composition, prepreg sheet containing the same, and metallic material having anticorrosive coating. 4,377,458, Cl. 204-159.160.

Watanabe, Keiji: *See—*
Tsuchihashi, Michihiro; Suzuki, Ryo; Watanabe, Keiji; and Saito, Masato, 4,377,772, Cl. 315-63.000.

Watanabe, Masaru: *See—*
Makino, Kenya; Sakurai, Hideo; Watanabe, Masaru; and Nishimura, Toshiyuki, 4,377,671, Cl. 526-124.000.

Watanabe, Osamu: *See—*
Hiraga, Yoichi; and Watanabe, Osamu, 4,377,562, Cl. 423-321.00S.
Otani, Takeshi; Watanabe, Osamu; and Sakaguchi, Masashi, 4,377,425, Cl. 148-437.000.

Watkins, William D.: *See—*
Hettinger, William P., Jr.; Carruthers, James D.; and Watkins, William D., 4,377,470, Cl. 208-120.000.

Watson, Richard A.: *See—*
Schiffbauer, William H.; and Watson, Richard A., 4,377,726, Cl. 179-1.00H.

Watts, Henry J.: *See—*
Boser, Ronald J.; and Watts, Henry J., 4,377,122, Cl. 112-265.100.

Weaver, Richard L. Silo unloading apparatus. 4,377,364, Cl. 414-307.000.

Webb, Scott D.: *See—*
Joo, Louis A.; Tucker, Kenneth W.; and Webb, Scott D., 4,377,463, Cl. 204-294.000.

Weber, David C.; Bilger, Alan H.; and Woodruff, Philip R., to Bendix Autolite Corporation. Oxygen sensor for detecting the oxygen content of an internal combustion engine exhaust gas system. 4,377,801, Cl. 338-34.000.

Webster, William C.: *See—*
Buschmann, John C.; Rasmussen, Elizabeth L.; Webster, William C.; and Veltman, Preston L., 4,377,414, Cl. 106-85.000.

Weed, Dean R.: *See—*
Abrahamovich, Karen M.; Hamel, Clifford J.; Payne, Edward H.; and Weed, Dean R., 4,377,633, Cl. 430-312.000.

Wehrli, Rudolf: *See—*
Ackermann, Peter; Gsell, Laurenz; and Wehrli, Rudolf, 4,377,532, Cl. 260-465.00E.
Ackermann, Peter; Gsell, Laurenz; and Wehrli, Rudolf, 4,377,593, Cl. 424-282.000.

Weidlich, Herbert: *See—*
Pettenpaul, Ewald; Huber, Jakob; and Weidlich, Herbert, 4,377,030, Cl. 29-576.00B.

Weil, Hans Jack. Private cubicle enclosure. 4,377,195, Cl. 160-237.000.

Weisenburger, Lawrence P., to AMP Incorporated. Carrier mounted terminals. 4,377,321, Cl. 339-220.00R.

Weisrock, William P., to Standard Oil Company (Indiana). Method for producing a low viscosity xanthan gum. 4,377,637, Cl. 435-104.000.

Welland, David R.: *See—*
Blackmer, David E.; and Welland, David R., 4,377,792, Cl. 333-14.000.

Welling, John R.; and Mattox, Donald L., to Motorola Inc. Passive, recyclable cooling system for missile electronics. 4,377,198, Cl. 165-32.000.

Wescom Switching, Inc.: *See—*
Garringer, Roy T.; and Gierut, Lacrence G., 4,377,843, Cl. 364-200.000.

West, George A.: *See—*
Arends, Albert W.; Pickard, George L.; West, George A.; and Russell, Edward J., 4,377,377, Cl. 425-155.000.

Wested, Jens, to Elektronikcentralen. Solar cell unit and a panel or battery composed of a plurality of such solar cell units. 4,377,722, Cl. 136-244.000.

Westerhausen, Robert, to Wonder Wind Enterprises, Inc. Windmill. 4,377,373, Cl. 416-197.00A.

Western Electric Co., Inc.: *See—*
Kurowski, Casimir J., 4,377,626, Cl. 430-5.000.

Western Technology, Inc.: *See—*
Drake, Eldon L., 4,377,763, Cl. 310-87.000.

Westfall, Leonard J. Swing speed analyzer. 4,377,125, Cl. 116-67.00R.

Westinghouse Electric Corp.: *See—*
Elms, Robert T.; Saletta, Gary F.; and Mercier, Bernard J., 4,377,836, Cl. 361-96.000.
Grunert, Kurt A.; Paton, Charles R.; Henwood, John J.; Dauer, John J., Jr.; and DeVault, Birch L., 4,377,796, Cl. 335-131.000.
Hirayama, Chikara; and Lin, Ching-Yu, 4,377,460, Cl. 204-195.00S.
Matsko, Joseph J.; and Wafer, John A., 4,377,837, Cl. 361-105.000.
Mooney, David H., Jr.; and Harriger, Keith A., 4,377,811, Cl. 343-7.00A.
Pope, James M.; Wood, Susan; and Harrison, Don E., 4,377,507, Cl. 252-629.000.
Schreiner, Charles P., 4,377,241, Cl. 211-133.000.

Westman, Robert E. Home care denture cleaning tool. 4,377,381, Cl. 433-141.000.

Whelen Engineering Company, Inc.: *See—*
Ferenc, Robert A., 4,377,802, Cl. 340-84.000.

Whitley, George J., to RCA Corporation. System for securing component leads to printed circuit boards. 4,377,026, Cl. 29-564.100.

Whitney, John M.: *See—*
Beaver, Jack L.; Schroeder, Jerry P.; and Whitney, John M., 4,377,346, Cl. 374-1.000.

Whitt, Everett D. Surgical breathing apparatus. 4,377,161, Cl. 128-200.240.

Wiedemann, Karl. Apparatus for sucking up and holding sludge. 4,377,475, Cl. 210-136.000.

Wienand, Josef; and Beihammer, Horst, to Stahlwerke Bruninghaus Gesellschaft mit beschrankter Haftung. Cylindrical helical compression spring. 4,377,280, Cl. 267-180.000.

Wilder, Joseph R.; Reick, Franklin G.; and Picut, Frederick R. Surgical evacuator. 4,377,166, Cl. 128-278.000.

Wilhelm Hegenscheidt Gesellschaft mbH: *See—*
Boesch, Theo, 4,377,023, Cl. 29-27.00R.

Wilks, Robert S.; and Sturges, Robert H., Jr., to United States of America, Energy. Flaw detection and evaluation. 4,377,238, Cl. 209-587.000.

Willard, John W., Sr., to Caw Industries, Inc. Processes for employing treated solid carbonaceous fossil fuels. 4,377,599, Cl. 426-310.000.

Williams, Donald R. Three-dimensional teaching device. 4,377,384, Cl. 434-209.000.

Williams, Haydn W. R.: *See—*
Cragoe, Edward J., Jr.; Rooney, Clarence S.; and Williams, Haydn W. R., 4,377,588, Cl. 424-270.000.

Willis, Donald H., to RCA Corporation. Television receiver ferroresonant power supply disabling circuit. 4,377,775, Cl. 315-411.000.

Wilson, Harold R., to Haworth Mfg., Inc. Space divider wall structure with multiple circuit power system. 4,377,724, Cl. 174-48.000.

Wilson, Woodrow S.: *See—*
Hazard, Robert E.; and Wilson, Woodrow S., 4,377,247, Cl. 222-517.000.

Windings, Inc.: *See—*
Zajac, Ronald E., 4,377,262, Cl. 242-1.000.

Wire Products Company, Inc.: *See—*
Kennedy, Edward S., 4,377,360, Cl. 411-116.000.

Wisander, Donald W.; and Bill, Robert C., to United States of America, National Aeronautics and Space Administration. Laser surface fusion of plasma sprayed ceramic turbine seals. 4,377,371, Cl. 415-174.000.

Wisconsin Alumni Research Foundation: *See—*
Larsen, Howard J., 4,377,596, Cl. 426-2.000.

Wohler, Wayne L.: *See—*
Lotspiech, Jeffrey B.; and Wohler, Wayne L., 4,377,803, Cl. 382-9.000.

Wojnarowski, Robert J.: *See—*
Eichelberger, Charles W.; and Wojnarowski, Robert J., 4,377,505, Cl. 252-512.000.

Wolff, Kenneth T., to Data General Corporation. Light pen detection circuit and method. 4,377,810, Cl. 340-707.000.

Wolford, John W. Stand for musical instruments. 4,377,268, Cl. 248-176.000.

Wollar, Burnell J., to Phillips Plastics Corp. Expansion fastner. 4,377,358, Cl. 411-15.000.

Wolter, Heinz, to DOM-Sicherheitstechnik GmbH & Co. KG. Cylinder-lock with flat key. 4,377,082, Cl. 70-364.00A.

Wolverine Corporation: *See—*
Brown, Ernest C.; and Buske, Walter E., 4,377,109, Cl. 99-401.000.

Wonder Wind Enterprises, Inc.: *See—*
Westerhausen, Robert, 4,377,373, Cl. 416-197.00A.

Woo, Barry B.: *See—*
Koford, James S.; Jensen, William C.; and Woo, Barry B., 4,377,862, Cl. 371-32.000.

Wood, Susan: *See—*
Pope, James M.; Wood, Susan; and Harrison, Don E., 4,377,507, Cl. 252-629.000.

Woodall, James F.: *See—*
Huffman, Eric C.; and Woodall, James F., 4,377,254, Cl. 494-12.000.

Woodard, Kenneth E., Jr.: *See—*
Kadija, Igor V.; and Woodard, Kenneth E., Jr., 4,377,455, Cl. 204-98.000.

Woodruff, Philip R.: *See—*
Weber, David C.; Bilger, Alan H.; and Woodruff, Philip R., 4,377,801, Cl. 338-34.000.

Woollven, Jack: *See—*
Metcalf, Eric; Woollven, Jack; Spens, Stephen N.; and Kett, Brian L. A., 4,377,782, Cl. 324-52.000.

Work, Dale E.: *See—*
Hart, Ronald L.; Work, Dale E.; Davis, Daniel; and Bayless, Robert G., 4,377,621, Cl. 428-425.800.

Workman, James P.; and Hudson, Larry L., to Realex Corporation. Tamper-resistant locking clip for dispensing pumps. 4,377,106, Cl. 92-23.000.

WRC Processing Company: *See—*
Barrick, Paul E.; and Zarur, George L., 4,377,486, Cl. 210-712.000.

Wright, Howard J.; Leonard, David P.; and Etzell, Roger A., to Cook Paint and Varnish Company. Acrylic resin-acrylic microgel compositions. 4,377,661, Cl. 524-522.000.

Wright, William B., Jr.: *See—*
Tomcufcik, Andrew S.; Wright, William B., Jr.; and Marsico, Joseph W., Jr., 4,377,589, Cl. 424-270.000.

Wu, Hsin C., to Standard Oil Co., The. Recovery and purification of olefinic nitriles. 4,377,444, Cl. 203-96.000.

Wunderlich, Klaus: *See—*
Harms, Wolfgang; Wunderlich, Klaus; and von Oertzen, Klaus, 4,377,688, Cl. 544-189.000.

Wurtman, Richard J., to Massachusetts Institute of Technology. Process for reducing depression. 4,377,595, Cl. 424-319.000.

Wyrepak Industries, Inc.: *See—*
Kovaleski, Joseph J.; and Bauer, Gordon L., 4,377,264, Cl. 242-25.00R.

Xerox Corporation: *See—*
Debesis, John R., 4,377,814, Cl. 346-140.00R.

Yamabe, Shigeru: *See—*
Fujimoto, Yasuo; and Yamabe, Shigeru, 4,377,702, Cl. 549-12.000.

Yamada, Shinji; and Nagoya, Mitsuru, to Rhythm Watch Company, Limited. Alarm signaling circuit for timepiece. 4,377,345, Cl. 368-245.000.

Yamaguchi, Kinichiro, to Kabushiki Kaisha Ekijibishon. Collapsible container. 4,377,191, Cl. 150-0.500.

Yamaguchi, Masumi; Kumagai, Yoshimi; and Kotaka, Kazunari, to Sharp Kabushiki Kaisha. Temperature-sensing probe structure for wireless temperature-sensing system. 4,377,733, Cl. 219-10.55B.

Yamaguchi, Shigehiro: *See—*
Minamida, Katsuhiro; and Yamaguchi, Shigehiro, 4,377,735, Cl. 219-121.0LM.

Yamamoto, Hiroaki: *See—*
Kikuoka, Takao; Yamamoto, Hiroaki; Sasaki, Noriyoshi; Wakui, Kotaro; Murakami, Keinosuke; Ohnishi, Kazunori; Kawamura, Gou; Noguchi, Hiroshi; and Ukigaya, Fumio, 4,377,787, Cl. 324-431.000.

Yamamoto, Takashi, to Fujitsu Limited. Method for forming an insulating layer on a polycrystalline silicon layer of a semiconductor device using a two-step thermal oxidation technique. 4,377,605, Cl. 427-93.000.

Yamasaki, Yasuo: *See—*
Sato, Kimihiko; Sakai, Tokuji; Yamasaki, Yasuo; Onodera, Tamio; and Sumitani, Koji, 4,377,718, Cl. 585-467.000.

Yamasawa, Masao: *See—*
Ohhata, Michinobu; Matsumura, Toshihiko; Yamasawa, Masao; Chujo, Takafumi; and Takahashi, Masayuki, 4,377,759, Cl. 307-491.000.

Yamashita, Kasane; Ikehata, Takao; Tate, Kazuhiko; and Nakahara, Keisuke, to Nippon Kokan Kabushiki Kaisha. Method of removing dissolved heavy metals from aqueous waste liquids. 4,377,483, Cl. 210-670.000.

Yamori, Akio: *See—*
Shiraki, Toshinori; Yamori, Akio; and Morita, Hideo, 4,377,665, Cl. 525-250.000.

Yanobu, Hideo, to Murata Kikai Kabushiki Kaisha. Double twister. 4,377,065, Cl. 57-279.000.

Yasui, Bompei; Miyamoto, Tomohisa; Hiraoka, Katsuyuki; and Sako, Yoshitaka, to Kabushiki Kaisha Cosmos Enterprise. Process for the preparation of 1-(4-hydroxyphenyl)-2-(4-benzylpiperidino)-1-propanol and acid-addition salts thereof. 4,377,691, Cl. 546-185.000.

Yew, Ming-Chih: *See—*
Finn, Bernard J.; and Yew, Ming-Chih, 4,377,298, Cl. 280-663.000.

Yi, Chicksu Thomas: *See—*
Jung, Jung D., 4,377,008, Cl. 2-403.000.

Yokohama Rubber Co., Ltd., The: *See—*
Watanabe, Hideo, 4,377,458, Cl. 204-159.160.

Yokoyama, Yasuo: *See—*
Takata, Terasu; Hangai, Makoto; and Yokoyama, Yasuo, 4,377,224, Cl. 192-18.00R.

York, Earl D., to Standard Oil Company (Indiana). Oil shale retorting method and apparatus. 4,377,465, Cl. 208-11.00R.

Yoshida, Kazufumi, to Hitachi, Ltd. Arithmetic unit for generating constants in an electronic computer of the microprogram-controlled type. 4,377,846, Cl. 364-200.000.

Yoshida Kogyo K. K.: *See—*
Takahashi, Kihei; Terada, Seiko; and Shimono, Muchiji, 4,377,189, Cl. 139-35.000.

Yoshida Kogyo K.K.: *See—*
Akashi, Shunji, 4,377,022, Cl. 24-205.11R.

Yoshida, Satoshi; Takeuchi, Hideaki; Shigyo, Masamichi; Iijima, Toshio; and Ikeda, Tomoaki, to Fuji Photo Film Company, Ltd. Process for producing vacuum deposition films. 4,377,607, Cl. 427-250.000.

Yoshida, Takao, to International Flavors & Fragrances Inc. Methyl substituted oxobicyclo-4,4,0-decane derivatives, process for preparing same and organoleptic uses thereof. 4,377,714, Cl. 568-819.000.

Yoshihara, Tsutomu; Shimotori, Kazuhiro; and Nagayama, Yasuji, to Mitsubishi Denki Kabushiki Kaisha. Substrate bias circuit. 4,377,756, Cl. 307-296.00R.

Yoshimoto, Masahiro: *See—*
Shirakawa, Norio; Tomioka, Hiromi; Koizumi, Masuo; Takeuchi, Masaki; Sugiyama, Hiroshi; Okada, Masanori; Yoshimoto, Masahiro; Iwane, Yoshitaka; and Murakami, Yasushi, 4,377,407, Cl. 71-76.000.

Youhill, Paul, to EMI Limited. Magnetic recording. 4,377,805, Cl. 340-347.0DD.

Young, Robert A. Photoionizer. 4,377,749, Cl. 250-423.00P.

Youngstown Steel Door Company: *See—*
Mayfield, Charles W.; and Jenkins, Oliver J., 4,377,304, Cl. 292-283.000.

Zackrisson, Barry L., to Dana Corporation. Bearing seal. 4,377,312, Cl. 308-187.100.

Zagata, R. J.: *See—*
Grasselli, R. K.; Suresh, D. D.; Zagata, R. J.; and Force, G. E., 4,377,500, Cl. 252-432.000.

Zajac, Ronald E., to Windings, Inc. Two-way collapsible mandrel with winding compression. 4,377,262, Cl. 242-1.000.

Zartman, David L., to New Mexico State University Foundation, Inc. Intravaginal anchoring device. 4,377,157, Cl. 128-1.00R.

Zarur, George L.: *See—*
Barrick, Paul E.; and Zarur, George L., 4,377,486, Cl. 210-712.000.

Zenith Radio Corporation: *See—*
Mycynek, Victor G., 4,377,823, Cl. 358-157.000.
Stacy, Carl W., 4,377,729, Cl. 179-2.0TV.

Zeringue, Hampden J., Jr.: *See—*
Feuge, Reuben O.; and Zeringue, Hampden J., Jr., 4,377,686, Cl. 536-119.000.

Zifferer, Lothar R.: *See—*
Shepherd, Dale H.; and Zifferer, Lothar R., 4,377,083, Cl. 72-68.000.

Zobel, Don W.; and Pace, W. David, to Motorola, Inc. Precision differential relaxation oscillator circuit. 4,377,790, Cl. 331-111.000.

Zodrow, Rudolf; and Mohn, Hans-Werner, to Jagenberg-Werke AG. Method and apparatus for affixing labels and foils to bottles. 4,377,432, Cl. 156-215.000.

Zomer, Giuseppe. Spectacle frames. 4,377,327, Cl. 351-119.000.

Zweifel, Hans; and Bellus, Daniel, to Ciba-Geigy Corporation. Photocrosslinkable polyamide with side tricyclic imidyl groups. 4,377,668, Cl. 525-426.000.

Zweifel, Hans; and Bellus, Daniel, to Ciba-Geigy Corporation. Photocrosslinkable polyester with side tricyclic imidyl groups. 4,377,669, Cl. 525-445.000.

Zwiehoff, Gunther: *See—*
Konemann, Bernd; Mucha, Joachim; and Zwiehoff, Gunther, 4,377,757, Cl. 307-303.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF MARCH, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Balint, Nikolaous K., to Standard Oil Company (Indiana). Catalyst system. Re. 31,187, Cl. 252-429.00B.

Bell Telephone Laboratories, Incorporated: *See*—
Pirz, Frank C.; and Rabiner, Lawrence R., Re. 31,188, Cl. 179-1.0SD.

Bonanno, Anthony J.: *See*—
Greenfield, Charles; and Bonanno, Anthony J., Re. 31,185, Cl. 159-1.0RW.

Brown, Maurice H. Terminal forming and installing apparatus. Re. 31,183, Cl. 226-134.000.

Exxon Research and Engineering Co.: *See*—
Rosensweig, Ronald E., Re. 31,186, Cl. 208-134.000.

General Motors Corporation: *See*—
Lederman, Frederick E., Re. 31,184, Cl. 280-668.000.

Greenfield, Charles; and Bonanno, Anthony J., to Hanover Research Corporation. Process and apparatus for dehydrating waste solids concentrates. Re. 31,185, Cl. 159-1.0RW.

Hanover Research Corporation: *See*—
Greenfield, Charles; and Bonanno, Anthony J., Re. 31,185, Cl. 159-1.0RW.

Lederman, Frederick E., to General Motors Corporation. Resilient mount for MacPherson strut. Re. 31,184, Cl. 280-668.000.

Pirz, Frank C.; and Rabiner, Lawrence R., to Bell Telephone Laboratories, Incorporated. Multiple template speech recognition system. Re. 31,188, Cl. 179-1.0SD.

Rabiner, Lawrence R.: *See*—
Pirz, Frank C.; and Rabiner, Lawrence R., Re. 31,188, Cl. 179-1.0SD.

Rosensweig, Ronald E., to Exxon Research and Engineering Co. Hydrocarbon conversion process utilizing a magnetic field in a fluidized bed of catalytic particles. Re. 31,186, Cl. 208-134.000.

Standard Oil Company (Indiana): *See*—
Balint, Nikolaous K., Re. 31,187, Cl. 252-429.00B.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Kavieff, Shelden M., to Jervis B. Webb Company. Pusher conveyor for wheeled carriers. B1 3,518,946, Cl. 104—172 B.

Jervis B. Webb Company; *See*—
Kavieff, Shelden M. B1 3,518,946, Cl. 104—172 B.

Matthew, Kenneth S.; and Dickey, Harry J., to Custom Accessories, Inc. Splash guard. B1 4,264,083, Cl. 280—154.5 R.

Custom Accessories, Inc.: *See*—
Matthew, Kenneth S.; Dickey, Harry J. B1 4,264,083, Cl. 280-154.5 R.

Driskell, Thomas, D.; Heller, Alfred L.; and Koenigs, Joseph F., to Miter, Inc. Dental prosthetic implants. B1 3,950,850, Cl. 433—176.

Miter, Inc.; *See*—
Driskell, Thomas D.; Heller, Alfred L.; and Koenigs, Joseph F., B1 3,950,850, Cl. 433—176.

LIST OF DESIGN PATENTEES

A.B.L. Jewelers, Inc.: *See*—
Shapiro, Jeffrey H., 268,336, Cl. D11-79.000.

Adams Hard-Facing Company, Inc.: *See*—
Ronck, Norvel J.; and Wetmore, Halsey J., II, 268,344, Cl. D15-29.000.

Aladdin Industries: *See*—
Wyatt, William B., Jr., 268,317, Cl. D7-38.000.

Aldrich, Thomas B., III. Bottle. 268,330, 3-22-83, Cl. D9-370.000.

Amba Marketing Systems, Inc.: *See*—
Schimmel, Otto K., 268,304, Cl. D3-43.000.

American Standard Inc.: *See*—
Saporito, Dominic A.; and Genaro, Donald M., 268,358, Cl. D23-28.000.

Amerock Corporation: *See*—
Tegner, Raymond U. H., 268,321, Cl. D8-317.000.

Amico, Frank. Toy doll. 268,354, 3-22-83, Cl. D21-171.000.

Amtrol Inc.: *See*—
Kirk, Kenneth L., 268,315, Cl. D6-196.000.

Apco Graphics, Inc.: *See*—
Cobb, Ronald W., 268,349, Cl. D20-10.000.
Cobb, Ronald W., 268,350, Cl. D20-10.000.

Apex Foot Products Corporation: *See*—
Malkin, Howard, 268,365, Cl. D24-64.000.

Argyropoulos, James P., to Cherokee Shoe Company, Inc. Shoe sole. 268,299, 3-22-83, Cl. D2-322.000.

Baru, Jes S.: *See*—
Tenzer, Abraham I.; and Baru, Jes S., 268,337, Cl. D11-152.000.

Beatrice Publishing Pty. Ltd.: *See*—
Branagan, John L. M., 268,327, Cl. D9-330.000.

Beleckis, Vytautas K., to Dennison National Company. Suspension bar for hanging files. 268,348, 3-22-83, Cl. D19-91.000.

Bell Telephone Laboratories, Incorporated: *See*—
Genaro, Donald M.; McGarvey, John N.; and Tyler, Daniel W., 268,342, Cl. D14-52.000.

Berkowitz, Irving L., to Kason Industries, Inc. Door control system. 268,322, 3-22-83, Cl. D8-330.000.

Bisacca, Mildred J.: *See*—
Witt, Frank H., Jr., 268,326, Cl. D9-307.000.

Branagan, John L. M., to Beatrice Publishing Pty. Ltd. Display holder. 268,327, 3-22-83, Cl. D9-330.000.

Brisebois, Robert W. Golf ball tee. 268,356, 3-22-83, Cl. D21-208.000.

Bufkor, Inc.: *See*—
Korn, Irving, 268,307, Cl. D6-85.000.

Cherokee Shoe Company, Inc.: *See*—
Argyropoulos, James P., 268,299, Cl. D2-322.000.

Coachmen Industries, Inc.: *See*—
Otto, Dennis F.; and Wamsley, Vernon R., 268,340, Cl. D12-157.000.

Cobb, Ronald W., to Apco Graphics, Inc. Sign. 268,349, 3-22-83, Cl. D20-10.000.

Cobb, Ronald W., to Apco Graphics, Inc. Directory sign. 268,350, 3-22-83, Cl. D20-10.000.

Cointreau Holding: *See*—
Cointreau, Pierre, 268,329, Cl. D9-370.000.

Cointreau, Pierre, to Cointreau Holding. Bottle. 268,329, 3-22-83, Cl. D9-370.000.

Creative Tech:Micro Electronics, Inc.: *See*—
Newman, Martin H.; and Iorio, Anthony J., 268,335, Cl. D10-92.000.

Dart Industries Inc.: *See*—
Tenzer, Abraham I.; and Baru, Jes S., 268,337, Cl. D11-152.000.

Dennison National Company: *See*—
Beleckis, Vytautas K., 268,348, Cl. D19-91.000.

De Persia, Gerald J. Storage chest. 268,311, 3-22-83, Cl. D6-150.000.

Dercks, Gerald A.; and Dercks, Michael J. Cremain vault. 268,374, 3-22-83, Cl. D99-5.000.

Dercks, Gerald A.; and Dercks, Michael J. Cremain vault. 268,375, 3-22-83, Cl. D99-5.000.

Dercks, Michael J.: *See*—
Dercks, Gerald A.; and Dercks, Michael J., 268,374, Cl. D99-5.000.
Dercks, Gerald A.; and Dercks, Michael J., 268,375, Cl. D99-5.000.

Donoski, Paul J.; Gentilella, Bruce S.; and Tsuji, Masao, to North American Philips Corporation. Carafe. 268,319, 3-22-83, Cl. D7-318.000.

Drake, Robert. Hydrotherapy spa. 268,363, 3-22-83, Cl. D24-38.000.

Economic-Kaluste Oy: *See*—
Rompotti, Kimmo P. K., 268,312, Cl. D6-179.000.

F.C.F. Limited: *See*—
McBrien, Roderick, 268,369, Cl. D28-13.000.
McBrien, Roderick, 268,370, Cl. D28-13.000.

Friedrich Grohe Armaturenfabrik GmbH & Co.: *See*—
Klose, Odo, 268,359, Cl. D23-35.000.

Fukuchi, Eiji: *See*—
Inae, Syoji; and Fukuchi, Eiji, 268,339, Cl. D12-136.000.

Gaski, Jeremy D. Shock-absorbing innersole. 268,303, 3-22-83, Cl. D2-318.000.

Gautier, Raoul L. A., to Societe Generale des Eaux Minerales de Vittel. Bottle. 268,324, 3-22-83, Cl. D9-406.000.

Genaro, Donald M.; McGarvey, John N.; and Tyler, Daniel W., to Bell Telephone Laboratories, Incorporated. Stand for a portable transceiver or similar article. 268,342, 3-22-83, Cl. D14-52.000.

Genaro, Donald M.: *See*—
Saporito, Dominic A.; and Genaro, Donald M., 268,358, Cl. D23-28.000.

Gentilella, Bruce S.: *See*—
Donoski, Paul J.; Gentilella, Bruce S.; and Tsuji, Masao, 268,319, Cl. D7-318.000.

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von Philipp, Fritz; and Schimanski, Georg, 268,361, Cl. D23-150.000.

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Gordy International, Inc.: *See*—
Steinberg, Alan M., 268,351, Cl. D21-17.000.
Steinberg, Alan M., 268,352, Cl. D21-17.000.

GRRN Co.: *See*—
Witt, Frank H., Jr., 268,326, Cl. D9-307.000.

Harada, Toshio: *See*—
Yamamura, Masamichi; Harada, Toshio; and Tanaka, Michio, 268,320, Cl. D7-351.000.

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Haslbeck, Joseph, 268,301, Cl. D2-234.000.

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Iorio, Anthony J.: *See*—
Newman, Martin H.; and Iorio, Anthony J., 268,335, Cl. D10-92.000.

Iwai, Yonosuke; and Takagi, Takeshi, to Matsushita Electric Works, Ltd. Electric shaver. 268,371, 3-22-83, Cl. D28-49.000.

Jonson, Alexander G., to Nestier Corporation. Citrus box. 268,373, 3-22-83, Cl. D34-40.000.

Kason Industries, Inc.: *See*—
Berkowitz, Irving L., 268,322, Cl. D8-330.000.

Katayama, Masaharu: *See*—
Kojima, Yoshio; Katayama, Masaharu; and Kimura, Haruyuki, 268,333, Cl. D10-57.000.

Kay, Nathan; and Kay, Robin M., to Max Factor & Co. Combined cosmetic container and support panel. 268,331, 3-22-83, Cl. D9-415.000.

Kay, Robin M.: *See*—
Kay, Nathan; and Kay, Robin M., 268,331, Cl. D9-415.000.

Kimura, Haruyuki: *See*—
Kojima, Yoshio; Katayama, Masaharu; and Kimura, Haruyuki, 268,333, Cl. D10-57.000.

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Klose, Odo, to Friedrich Grohe Armaturenfabrik GmbH & Co. Shower head. 268,359, 3-22-83, Cl. D23-35.000.

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Larko, Christina I. E., to Molnlycke Aktiebolag. Diaper. 268,364, 3-22-83, Cl. D24-50.000.

Latino, Richard M.: *See*—
Paquette, Edmund T.; and Latino, Richard M., 268,367, Cl. D26-76.000.

Levine, Rosalie S.: *See*—
Witt, Frank H., Jr., 268,326, Cl. D9-307.000.

Load Cells Inc.: *See*—
Harbers, H. C., Jr., 268,334, Cl. D10-91.000.

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Stark, Ted, 268,305, Cl. D3-71.000.

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Mann, Richard P.: *See*—
Mann, Milton; and Mann, Richard P., 268,343, Cl. D14-90.000.

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Matsushita Electric Industrial Co., Ltd.: *See*—
Yamamura, Masamichi; Harada, Toshio; and Tanaka, Michio, 268,320, Cl. D7-351.000.

Matsushita Electric Works, Ltd.: *See*—
Iwai, Yonosuke; and Takagi, Takeshi, 268,371, Cl. D28-49.000.

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Kay, Nathan; and Kay, Robin M., 268,331, Cl. D9-415.000.

McBrien, Roderick, to F.C.F. Limited. Hair dryer. 268,369, 3-22-83, Cl. D28-13.000.

McBrien, Roderick, to F.C.F. Limited. Hair dryer. 268,370, 3-22-83, Cl. D28-13.000.

McGarvey, John N.: *See*—
Genaro, Donald M.; McGarvey, John N.; and Tyler, Daniel W., 268,342, Cl. D14-52.000.

Meade, Marilyn A. Apron. 268,302, 3-22-83, Cl. D2-227.000.

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Marsh, James L., 268,347, Cl. D19-27.000.

Milani, Giancarlo. Drain board for shower stalls or the like. 268,308, 3-22-83, Cl. D6-86.000.

Mitsubishi Belting Ltd.: *See*—
Inae, Syoji; and Fukuchi, Eiji, 268,339, Cl. D12-136.000.

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Larko, Christina I. E., 268,364, Cl. D24-50.000.

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Newman, Martin H.; and Iorio, Anthony J., to Creative Tech:Micro Electronics, Inc. Bathroom scale. 268,335, 3-22-83, Cl. D10-92.000.

Nicholson, Francis E. Wooden soldier. 268,355, 3-22-83, Cl. D21-178.000.

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Donoski, Paul J.; Gentilella, Bruce S.; and Tsuji, Masao, 268,319, Cl. D7-318.000.

Otto, Dennis F.; and Wamsley, Vernon R., to Coachmen Industries, Inc. Luggage carrier. 268,340, 3-22-83, Cl. D12-157.000.

Pace Collection, Inc., The: *See*—
Rosen, Irving M., 268,310, Cl. D6-146.000.

Palmer, Rundlette K. Flag holder. 268,338, 3-22-83, Cl. D11-183.000.

Paquette, Edmund T.; and Latino, Richard M., to Wright Line Inc. Light module for attachment to desk organizer. 268,367, 3-22-83, Cl. D26-76.000.

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Mallon, William D., 268,341, Cl. D13-10.000.

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Rolf C. Hagen (USA) Corp.: *See*—
Holbrook, Arthur J., 268,360, Cl. D23-77.000.

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Schaumloffel, Eric K. Handle nut. 268,323, 3-22-83, Cl. D8-397.000.
Schimanski, Georg: *See*—
von Philipp, Fritz; and Schimanski, Georg, 268,361, Cl. D23-150.000.
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Shapiro, Jeffrey H., to A.B.L. Jewelers, Inc. Pendant. 268,336, 3-22-83, Cl. D11-79.000.
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Kobayashi, Yoshiaki, 268,346, Cl. D18-7.000.
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Gautier, Raoul L. A., 268,324, Cl. D9-406.000.
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Steinberg, Alan M., to Gordy International, Inc. Table-top maze game. 268,351, 3-22-83, Cl. D21-17.000.
Steinberg, Alan M., to Gordy International, Inc. Hand-held maze game. 268,352, 3-22-83, Cl. D21-17.000.
Sun Terrace Casual Furniture: *See*—
Smith, Kyle W., 268,314, Cl. D6-191.000.
Takagi, Takeshi: *See*—
Iwai, Yonosuke; and Takagi, Takeshi, 268,371, Cl. D28-49.000.
Tanaka, Michio: *See*—
Yamamura, Masamichi; Harada, Toshio; and Tanaka, Michio, 268,320, Cl. D7-351.000.
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Kojima, Yoshio; Katayama, Masaharu; and Kimura, Haruyuki, 268,333, Cl. D10-57.000.
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Donoski, Paul J.; Gentilella, Bruce S.; and Tsuji, Masao, 268,319, Cl. D7-318.000.
Tyler, Daniel W.: *See*—
Genaro, Donald M.; McGarvey, John N.; and Tyler, Daniel W., 268,342, Cl. D14-52.000.
von Philipp, Fritz; and Schimanski, Georg, to Globol-Werk GmbH. Air freshener or similar article. 268,361, 3-22-83, Cl. D23-150.000.
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Wamsley, Vernon R.: *See*—
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Wetmore, Halsey J., II: *See*—
Ronck, Norvel J.; and Wetmore, Halsey J., II, 268,344, Cl. D15-29.000.
Witt, Frank H., Jr., to Levine, Rosalie S.; Bisacca, Mildred J.; and GRRN Co., part interest to each. Flask or similar article. 268,326, 3-22-83, Cl. D9-307.000.
Wong, Frances. Acupressure apparatus. 268,362, 3-22-83, Cl. D24-36.000.
Wright Line Inc.: *See*—
Paquette, Edmund T.; and Latino, Richard M., 268,367, Cl. D26-76.000.
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Xerox Corporation: *See*—
Robertson, Donald A., 268,345, Cl. D16-30.000.
Yamamura, Masamichi; Harada, Toshio; and Tanaka, Michio, to Matsushita Electric Industrial Co., Ltd. Microwave oven. 268,320, 3-22-83, Cl. D7-351.000.

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Warriner, William A., 5,000, Cl. 20.000.
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Warriner, William A., 5,002, Cl. 27.000.
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McRae, Edward A., to Melridge, Inc. Lily plant (Lilium Goldrush). 5,008, 3-22-83, Cl. 68.000.
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McRae, Edward A., 5,005, Cl. 68.000.
McRae, Edward A., 5,006, Cl. 68.000.
McRae, Edward A., 5,007, Cl. 68.000.
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CLASSIFICATION OF PATENTS

ISSUED MARCH 22, 1983

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

105 4,377,007
403 4,377,008
411 4,377,009

CLASS 3

1.4 4,377,010

CLASS 5

102 4,377,011

CLASS 8

94.17 4,377,387
128 R 4,377,388
506 4,377,389
671 4,377,390

CLASS 12

16.4 4,377,012

CLASS 15

25 4,377,013
56 4,377,014
162 4,377,015
215 4,377,016
236 C 4,377,412
320 4,377,017
322 4,377,018

CLASS 16

307 4,377,019
329 4,377,020

CLASS 19

80 R 4,377,021

CLASS 24

205.11 R 4,377,022

CLASS 26

112 R 4,377,513

CLASS 29

27 R 4,377,023
157.3 C 4,377,024
434 4,377,025
564.1 4,377,026
566.1 4,377,027
574 4,377,028
576 B 4,377,029
4,377,030
4,377,031
599 4,377,032
623.5 4,377,033

CLASS 30

41 4,377,034
147 4,377,035

CLASS 33

125 A 4,377,036
169 F 4,377,037
203.18 4,377,038

CLASS 34

1 4,377,039
16.5 4,377,040

CLASS 36

30 R 4,377,041
101 4,377,042

CLASS 37

18 R 4,377,043
245 4,377,044

CLASS 38

11 4,377,045

CLASS 40

16.4 4,377,046
21 C 4,377,047
367 4,377,048
465 4,377,049
615 4,377,050

CLASS 44

51 4,377,391
4,377,392
53 4,377,393

CLASS 46

77 4,377,051
79 4,377,052

CLASS 47

42 4,377,053
57.6 4,377,054

CLASS 48

62 R 4,377,394

CLASS 49

388 4,377,055
462 4,377,056

CLASS 51

359 4,377,057

CLASS 52

45 4,377,058
98 4,377,059
489 4,377,060

CLASS 53

433 4,377,061

CLASS 55

38 4,377,395
59 4,377,396
97 4,377,397
208 4,377,398
226 4,377,399
269 4,377,400
290 4,377,401

CLASS 56

14.3 4,377,062
202 4,377,063
328 R 4,377,064

CLASS 57

279 4,377,065

CLASS 60

39.05 4,377,066
39.55 4,377,067
342 4,377,068
547.1 4,377,069
602 4,377,070
641.8 4,377,071
682 4,377,072
693 4,377,073

CLASS 62

10 4,377,402
183 4,377,074
372 4,377,075
395 4,377,076
457 4,377,077

CLASS 63

2 4,377,078
15.8 4,377,079

CLASS 65

3.11 4,377,403
59.22 4,377,404
136 4,377,405

CLASS 68

205 R 4,377,080

CLASS 69

6.5 4,377,081

CLASS 70

364 A 4,377,082

CLASS 71

36 4,377,406
76 4,377,407
92 4,377,408

CLASS 72

68 4,377,083
325 4,377,084
359 4,377,085

CLASS 73

35 4,377,086
594 4,377,087
640 4,377,088
818 4,377,089
861.74 4,377,090
861.87 4,377,091

CLASS 74

41 4,377,092
477 4,377,093
710.5 4,377,094
759 4,377,095

CLASS 75

0.5 R 4,377,409
112 4,377,410

CLASS 81

3.38 A 4,377,096

CLASS 83

98 4,377,097
310 4,377,098
467 R 4,377,099
698 4,377,100

CLASS 84

1.16 4,377,101
184 4,377,102

CLASS 89

1.5 R 4,377,103
45 4,377,104

CLASS 91

391 R 4,377,105

CLASS 92

23 4,377,106

CLASS 98

40 V 4,377,107

CLASS 99

290 4,377,108
401 4,377,109
489 4,377,110

CLASS 101

44 4,377,111
246 4,377,112

CLASS 102

209 4,377,113

CLASS 104

172 B B1 3,518,946

CLASS 106

76 4,377,413
85 4,377,414
90 4,377,415
98 4,377,416
300 4,377,417
306 4,377,418
900 4,377,419

CLASS 108

103 4,377,114

CLASS 110

234 4,377,115
235 4,377,116
248 4,377,117
343 4,377,118
346 4,377,119

CLASS 112

158 E 4,377,120
231 4,377,121
265.1 4,377,122

CLASS 114

126 4,377,123
128 4,377,124

CLASS 116

67 R 4,377,125

CLASS 118

47 4,377,126
306 4,377,127
317 4,377,128
412 4,377,129

CLASS 119

51.5 4,377,130
148 4,377,131

CLASS 122

7 R 4,377,132
31 A 4,377,133
479 B 4,377,134

CLASS 123

25 J 4,377,135
44 C 4,377,136
179 B 4,377,137
179 H 4,377,138
358 4,377,139
415 4,377,140
438 4,377,141
440 4,377,142
4,377,143
490 4,377,144
494 4,377,145
520 4,377,146
527 4,377,147
549 4,377,148
557 4,377,149
588 4,377,150
618 4,377,151

CLASS 124

88 4,377,152

CLASS 126

285 R 4,377,153
425 4,377,154
443 4,377,155
450 4,377,156

CLASS 128

1 R 4,377,157
4,377,158
155 4,377,159
156 4,377,160
200.24 4,377,161
200.28 4,377,162
205.22 4,377,163
207.14 4,377,164
214.4 4,377,165
278 4,377,166
285 4,377,167
303.1 4,377,168
639 4,377,170
736 4,377,171

CLASS 131

282 4,377,172
291 4,377,173

CLASS 132

9 4,377,174

CLASS 134

2 4,377,420
138 4,377,175

CLASS 136

244 4,377,722
249 4,377,723

CLASS 137

15 4,377,177
385 4,377,178
493.2 4,377,176
494 4,377,179
528 4,377,180
584 4,377,181
596.1 4,377,182
606 4,377,183

CLASS 138

1.5 4,377,184
137 4,377,185
171 4,377,186
414 4,377,187
437 4,377,188

CLASS 139

35 4,377,189

CLASS 144

193 A 4,377,190

CLASS 148

1.5 4,377,421
137 4,377,422
171 4,377,423
414 4,377,424
437 4,377,425

CLASS 149

109.6 4,377,426

CLASS 150

0.5 4,377,191
12 4,377,192

CLASS 152

354 R 4,377,193

CLASS 156

73.2 4,377,427
73.5 4,377,428
153 4,377,429
184 4,377,430
206 4,377,431
215 4,377,432
326 4,377,433
364 4,377,434
384 4,377,435
626 4,377,436
628 4,377,437
643 4,377,438

CLASS 159

1 RW Re.31,185

CLASS 160

168 R 4,377,194
237 4,377,195

CLASS 162

30.1 4,377,439
101 4,377,440

CLASS 164

66.1 4,377,196
112 4,377,197

CLASS 165

32 4,377,198
47 4,377,199
76 4,377,200
4,377,201
86 4,377,202
125 4,377,203
166 4,377,204

CLASS 166

59 4,377,205
97 4,377,206
212 4,377,207
265 4,377,208

CLASS 169

26 4,377,209
62 4,377,210

CLASS 172

375 4,377,211
376 4,377,212

CLASS 174

48 4,377,724

CLASS 175

211 4,377,213

CLASS 177

25 4,377,214

CLASS 179

1 GS 4,377,725
4,377,728
1 H 4,377,726
1 SD Re.31,188
1 ST 4,377,727
2 TV 4,377,729
170 NC 4,377,730

CLASS 180

21 4,377,215
73 TL 4,377,216
143 4,377,217
300 4,377,218

CLASS 181

155 4,377,219

CLASS 188

44 4,377,220
181 A 4,377,221

CLASS 192

0.02 R 4,377,222
3.3 4,377,226
3.58 4,377,223
18 R 4,377,224
107 C 4,377,225

CLASS 194

4 R 4,377,227
54 4,377,228

CLASS 198

494 4,377,229
525 4,377,230

CLASS 200

80 R 4,377,731

CLASS 202

153 4,377,441
263 4,377,442

CLASS 203

1 4,377,443
96 4,377,444

CLASS 204

1 R 4,377,445
1 T 4,377,446
15 4,377,447
46 G 4,377,448
46 R 4,377,449
4,377,450
59 R 4,377,451
67 4,377,452
78 4,377,453
95 4,377,454
98 4,377,455
109 4,377,456
159.16 4,377,457
4,377,458
159.18 4,377,459
195 S 4,377,460
198 4,377,461
253 4,377,462
294 4,377,463

CLASS 206

44 R 4,377,231
44.11 4,377,232
310 4,377,233
432 4,377,234
477 4,377,235
540 4,377,236
630 4,377,237

CLASS 208

8 LE 4,377,464
11 R 4,377,465
4,377,466
33 4,377,467
111 4,377,468
4,377,469
120 4,377,470
134 Re.31,186
262 4,377,471

CLASS 209

166 4,377,472
167 4,377,473
279 4,377,474
587 4,377,238

CLASS 210

136 4,377,475
167 4,377,476
170 4,377,477
242.3 4,377,478
350 4,377,479
4,377,480
500.2 4,377,481
635 4,377,482
670 4,377,483
698 4,377,484
704 4,377,485
712 4,377,486

CLASS 211

65 4,377,239
87 4,377,240
133 4,377,241

CLASS 215

21 4,377,242

CLASS 219

10.43 4,377,732
10.55 B 4,377,733
121 LH 4,377,736
121 LM 4,377,735
121 PE 4,377,734
275 4,377,737
490 4,377,738
497 4,377,739

CLASS 220

210 4,377,243
268 4,377,244

336 4,377,245

CLASS 222

56 4,377,246
517 4,377,247
543 4,377,248

CLASS 224

163 4,377,249

CLASS 225

2 4,377,250

CLASS 226

134 Re.31,183
195 4,377,251

CLASS 229

28 R 4,377,252

CLASS 235

472 4,377,741

CLASS 236

93 R 4,377,255

CLASS 239

117 4,377,256
419.3 4,377,257

CLASS 241

27 4,377,258
73 4,377,259
101.2 4,377,260
222 4,377,261

CLASS 242

1 4,377,262
18.1 4,377,263
25 R 4,377,264

CLASS 244

153 R 4,377,265
159 4,377,266
199 4,377,267

CLASS 248

176 4,377,268
188.6 4,377,269
441 R 4,377,270
460 4,377,271

CLASS 249

160 4,377,272

CLASS 250

204 4,377,742
223 R 4,377,743
231 SE 4,377,744
283 4,377,745
359.1 4,377,746
370 4,377,747
423 P 4,377,749
458.1 4,377,750
474.1 4,377,751
578 4,377,753

CLASS 251

210 4,377,273
327 4,377,274

CLASS 252

33.4 4,377,487
70 4,377,488
99 4,377,489
188.3 R 4,377,490
301.19 4,377,492
321 4,377,493
411 R 4,377,494
415 4,377,495
425.3 4,377,496
429 B Re.31,187
430 4,377,497
431 C 4,377,498
431 R 4,377,499
432 4,377,500
437 4,377,501
441 4,377,491
455 Z 4,377,502
4,377,503
4,377,504
512 4,377,505
609 4,377,506
629 4,377,507
631 4,377,508
633 4,377,509

CLASS 256

69 4,377,275

CLASS 260

97 4,377,510
112 B 4,377,512
112 R 4,377,511
4,377,514
112.5 LH 4,377,515
112.5 R 4,377,516
153 4,377,517
156 4,377,518

190 4,377,519
236.6 4,377,520
239 BA 4,377,521
239.3 D 4,377,522
244.4 4,377,523
245.2 R 4,377,524
424 4,377,526
429.9 4,377,527
440 4,377,528
4,377,529
453 P 4,377,530
465 E 4,377,532
465 F 4,377,531
465.1 4,377,533
465.3 4,377,534
505 C 4,377,535
544 N 4,377,536
969 4,377,537

CLASS 261

44 C 4,377,538
121 B 4,377,539

CLASS 264

23 4,377,540
56 4,377,541
65 4,377,542
120 4,377,543
139 4,377,544
167 4,377,545
232 4,377,546
262 4,377,547
265 4,377,548
320 4,377,549

CLASS 266

56 4,377,276
80 4,377,277
197 4,377,278

CLASS 267

103 4,377,279
180 4,377,280

CLASS 272

120 4,377,281
124 4,377,282

CLASS 273

1.5 A 4,377,284
1.5 R 4,377,283
73 D 4,377,288
148 A 4,377,285
153 S 4,377,286
252 4,377,287

CLASS 277

12 4,377,289
38 4,377,290
105 4,377,291

CLASS 279

46 R 4,377,292

CLASS 280

154.5 R B1 4,264,083
6 R 4,377,293
154.5 R 4,377,294
303 4,377,295
425 R 4,377,296
609 4,377,297
663 4,377,298
668 Re.31,184
708 4,377,299
758 4,377,300

CLASS 285

62 4,377,301
334 4,377,302

CLASS 292

152 4,377,303
283 4,377,304

CLASS 294

106 4,377,305
147 4,377,306

CLASS 296

136 4,377,307

CLASS 297

353 4,377,308
423 4,377,309

CLASS 299

13 4,377,310
75 4,377,311

CLASS 307

114 4,377,754
296 R 4,377,756
303 4,377,757
417 4,377,758
491 4,377,759
530 4,377,760

CLASS 308

187.1 4,377,312

216 4,377,313

CLASS 310

12 4,377,761
42 4,377,762
87 4,377,763
260 4,377,764
312 4,377,765

CLASS 312

297 4,377,314

CLASS 313

244 4,377,766
412 4,377,767
467 4,377,768
495 4,377,769

CLASS 315

3.6 4,377,770
63 4,377,772
047 4,377,771
111.81 4,377,773
241 P 4,377,774
411 4,377,775
4,377,776

CLASS 318

68 4,377,777
341 4,377,778
811 4,377,779

CLASS 322

29 4,377,780

CLASS 323

299 4,377,781

CLASS 324

52 4,377,782
61 R 4,377,783
158 MG 4,377,784
378 4,377,785
426 4,377,786
431 4,377,787

CLASS 330

136 4,377,788
253 4,377,789

CLASS 331

111 4,377,790

CLASS 332

9 R 4,377,791

CLASS 333

14 4,377,792
165 4,377,793
4,377,794

CLASS 335

23 4,377,795
131 4,377,796
153 4,377,797
202 4,377,798
266 4,377,799

CLASS 338

2 4,377,800
34 4,377,801

CLASS 339

17 CF 4,377,316
17 R 4,377,315
29 B 4,377,317
75 M 4,377,318
4,377,319
177 R 4,377,320
220 R 4,377,321

CLASS 340

84 4,377,802
310 A 4,377,804
347 DD 4,377,805
4,377,806
347 P 4,377,807
527 4,377,808
623 4,377,809
707 4,377,810

CLASS 343

7 A 4,377,811
872 4,377,812

CLASS 346

33 ME 4,377,813
140 R 4,377,814
4,377,815

CLASS 350

96.2 4,377,322
96.21 4,377,323
166 4,377,324
423 4,377,325
471 4,377,326

CLASS 351

119 4,377,327
126 4,377,328

160 R 4,377,329

CLASS 354

25 4,377,330
300 4,377,331

CLASS 355

3 DD 4,377,332
4,377,334
3 FU 4,377,335
4,377,336
3 SH 4,377,333
8 4,377,337
14 D 4,377,338
27 4,377,339

CLASS 356

237 4,377,340
239 4,377,341
307 4,377,342
357 4,377,343

CLASS 357

13 4,377,816
22 4,377,817
23 4,377,818
59 4,377,819

CLASS 358

21 R 4,377,820
133 4,377,821
139 4,377,822
157 4,377,823

CLASS 360

10.3 4,377,824
48 4,377,825
72.1 4,377,826
78 4,377,827
88 4,377,828
96.5 4,377,829
98 4,377,830
128 4,377,831

CLASS 361

56 4,377,832
79 4,377,833
82 4,377,834
91 4,377,835
96 4,377,836
105 4,377,837
228 4,377,838
233 4,377,839
320 4,377,840

CLASS 362

80 4,377,841

CLASS 363

20 4,377,842

CLASS 364

200 4,377,843
4,377,844
4,377,845
4,377,846
400 4,377,847
433 4,377,848
491 4,377,849
561 4,377,850
571 4,377,851
900 4,377,852
4,377,853

CLASS 365

2 4,377,854
49 4,377,855
154 4,377,856
185 4,377,857

CLASS 366

173 4,377,344

CLASS 368

245 4,377,345

CLASS 370

24 4,377,858
58 4,377,859
84 4,377,860
112 4,377,861

CLASS 371

32 4,377,862
42 4,377,863

CLASS 372

41 4,377,864
45 4,377,865

CLASS 374

1 4,377,346
139 4,377,347

CLASS 375

94 4,377,866

CLASS 376

245 4,377,550

260 4,377,551
405 4,377,552

CLASS 377

2 4,377,740
63 4,377,755

CLASS 378

19 4,377,867
50 4,377,869
019 4,377,868
110 4,377,748
152 4,377,752

CLASS 382

9 4,377,803

CLASS 400

124 4,377,348

CLASS 401

115 4,377,349

CLASS 403

161 4,377,350
348 4,377,351

CLASS 405

115 4,377,352
130 4,377,353
171 4,377,354
232 4,377,355

CLASS 406

109 4,377,356

CLASS 408

115 R 4,377,357

CLASS 411

15 4,377,358
112 4,377,359
116 4,377,360
161 4,377,361

CLASS 414

43 4,377,362
93 4,377,363
307 4,377,364
334 4,377,365
466 4,377,366
545 4,377,367
748 4,377,368

CLASS 415

9 4,377,370
174 4,377,371

CLASS 416

117 4,377,372
197 A 4,377,373

CLASS 417

228 4,377,374

CLASS 420

578 4,377,411
584 4,377,553

CLASS 422

239 4,377,554

CLASS 423

6 4,377,555
42 4,377,556
242 4,377,557
300 4,377,558
317 4,377,559
321 R 4,377,560
4,377,561
321 S 4,377,562
345 4,377,563
349 4,377,564
446 4,377,565
631 4,377,566

CLASS 424

1 4,377,567
31 4,377,568
85 4,377,569
88 4,377,570
93 4,377,571
101 4,377,572
177 4,377,573
4,377,574
243 4,377,575
244 4,377,576
247 4,377,577
250 4,377,578
4,377,579
251 4,377,580
4,377,581
4,377,582
4,377,583
258 4,377,584
263 4,377,585
266 4,377,586
269 4,377,587
270 4,377,588

4,377,589
271 4,377,590
274 4,377,591
275 4,377,592
282 4,377,593
309 4,377,594
319 4,377,595

CLASS 425

8 4,377,375
78 4,377,376
155 4,377,377

CLASS 426

2 4,377,596
92 4,377,597
108 4,377,598
310 4,377,599
424 4,377,600
472 4,377,601
656 4,377,602

CLASS 427

25 4,377,603
75 4,377,604
93 4,377,605
172 4,377,606
250 4,377,607
350 4,377,608

CLASS 428

71 4,377,609
88 4,377,610
192 4,377,611
212 4,377,612
4,377,613
213 4,377,614
4,377,615
4,377,616
214 4,377,617
323 4,377,618
333 4,377,619
372 4,377,620
425.8 4,377,621
605 4,377,622

CLASS 429

15 4,377,623
191 4,377,624
198 4,377,625

CLASS 430

5 4,377,626
22 4,377,627
57 4,377,628
62 4,377,629
176 4,377,630
192 4,377,631
218 4,377,632
312 4,377,633
440 4,377,634
564 4,377,635

CLASS 431

140 4,377,378

CLASS 433

176 B1 3,950,850
77 4,377,379
89 4,377,380
141 4,377,381
176 4,377,382

CLASS 434

209 4,377,384
348 4,377,383

CLASS 435

101 4,377,636
104 4,377,637
136 4,377,638
285 4,377,639

CLASS 436

32 4,377,640
178 4,377,641

CLASS 444

786 4,377,369

CLASS 455

2 4,377,870
76 4,377,871

CLASS 464

69 4,377,386
142 4,377,385

CLASS 494

12 4,377,254
38 4,377,253

CLASS 501

20 4,377,642

CLASS 518

713 4,377,643

CLASS 521

94 4,377,644
137 4,377,645
154 4,377,646

CLASS 523

518 4,377,647

CLASS 524

35 4,377,648
49 4,377,649
88 4,377,650
101 4,377,651
104 4,377,652
129 4,377,653
236 4,377,654
313 4,377,655
413 4,377,656
424 4,377,657
425 4,377,658
457 4,377,659
494 4,377,660
522 4,377,661

CLASS 525

64 4,377,663
94 4,377,664
132 4,377,666
250 4,377,665
394 4,377,662
400 4,377,667
426 4,377,668
445 4,377,669
467 4,377,670

CLASS 526

124 4,377,671
203 4,377,672
262 4,377,673

CLASS 527

301 4,377,674

CLASS 528

25 4,377,675
26.5 4,377,676
35 4,377,677
75 4,377,678
4,377,679
123 4,377,680
193 4,377,681
301 4,377,682
336 4,377,683
486 4,377,684

CLASS 536

119 4,377,685
4,377,686

CLASS 544

164 4,377,687
189 4,377,688

CLASS 546

15 4,377,689
19 4,377,690
185 4,377,691
186 4,377,692

CLASS 548

202 4,377,693
264 4,377,694
305 4,377,695
335 4,377,696
336 4,377,697
455 4,377,698
461 4,377,525
469 4,377,699
475 4,377,700
533 4,377,701

CLASS 549

12 4,377,702
24 4,377,703
39 4,377,704
550 4,377,705

CLASS 556

482 4,377,706

CLASS 560

220 4,377,707
266 4,377,708

CLASS 562

459 4,377,709

CLASS 564

281 4,377,710

CLASS 568

588 4,377,711
635 4,377,712
639 4,377,713
819 4,377,714

CLASS 570

123 4,377,715
153 4,377,716
172 4,377,717

CLASS 585

467 4,377,718
509 4,377,719
527 4,377,720
722 4,377,721

CLASS 604

8 4,377,169

CLASSIFICATION OF DESIGNS

D2— 227 268,302
234 268,301
264 268,298
318 268,303
322 268,299
400 268,300
D3— 43 268,304
71 268,305
74 268,306
D6— 85 268,307
86 268,308
125 268,309
146 268,310
150 268,311
179 268,312
186 268,313
191 268,314
196 268,315
242 268,316
D7— 38 268,317
43 268,318
318 268,319
351 268,320
D8— 317 268,321
330 268,322
397 268,323
D9— 300 268,325
307 268,326
330 268,327
347 268,328
370 268,329
268,330
406 268,324
415 268,331
D10— 32 268,332
57 268,333
91 268,334
92 268,335
D11— 79 268,336
152 268,337
183 268,338
D12— 136 268,339
157 268,340
D13— 10 268,341
D14— 52 268,342
90 268,343
D15— 29 268,344
D16— 30 268,345
D18— 7 268,346
D19— 27 268,347
91 268,348
D20— 10 268,349
268,350
D21— 17 268,351
268,352
23 268,353
171 268,354
178 268,355
208 268,356
214 268,357
D23— 28 268,358
35 268,359
77 268,360
150 268,361
D24— 36 268,362
38 268,363
50 268,364
64 268,365
D26— 39 268,366
76 268,367
D27— 06 268,368
D28— 13 268,369
268,370
49 268,371
D34— 25 268,372
40 268,373
D99— 5 268,374
268,375

CLASSIFICATION OF PLANTS

P.— 20 5,000
24 5,001
27 5,002
37 5,003
65 5,004
68 5,005
5,006
5,007
5,008
76 5,009
80 5,010

GEOGRAPHICAL INDEX

OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,377,266		4,377,604		4,377,752	4,377,839	4,377,613	4,377,267
	4,377,406		4,377,610		4,377,802	4,377,841	4,377,625	4,377,397
	4,377,719		4,377,611		4,377,858	4,377,843	4,377,632	4,377,484
04 :	4,377,175		4,377,620	10 :	4,377,705	4,377,866	4,377,654	4,377,661
	4,377,198		4,377,636		4,377,723	18 : 4,377,153	4,377,656	4,377,681
	4,377,245		4,377,641	11 :	4,377,089	4,377,160	4,377,680	4,377,693
	4,377,398		4,377,646	12 :	4,377,222	4,377,219	4,377,692	4,377,708
	4,377,426		4,377,657		4,377,263	4,377,236	4,377,810	30 : 4,377,571
	4,377,790		4,377,659		4,377,268	4,377,525	4,377,864	31 : 4,377,046
	4,377,806		4,377,674		4,377,284	4,377,527	26 : 4,377,056	4,377,152
	4,377,832		4,377,727		4,377,303	4,377,549	4,377,085	4,377,569
	4,377,848		4,377,741		4,377,352	4,377,583	4,377,093	32 : 4,377,288
05 :	4,377,038		4,377,747		4,377,375	4,377,673	4,377,099	33 : 4,377,213
	4,377,402		4,377,749		4,377,381	4,377,775	4,377,100	4,377,737
06 :	4,377,008		4,377,755		4,377,430	4,377,776	4,377,105	4,377,792
	4,377,011		4,377,809		4,377,472	4,377,788	4,377,143	34 : Re.31,185
	4,377,025		4,377,827		4,377,520	19 : 4,377,149	4,377,162	Re.31,186
	4,377,050		4,377,828		4,377,807	4,377,296	4,377,164	Re.31,188
	4,377,070		4,377,831		4,377,871	4,377,795	4,377,210	4,377,049
	4,377,072		4,377,844	13 :	4,377,014	20 : 4,377,106	4,377,215	4,377,066
	4,377,115		4,377,850		4,377,058	4,377,272	4,377,225	4,377,079
	4,377,117		4,377,853		4,377,080	4,377,283	4,377,241	4,377,173
	4,377,131		4,377,856		4,377,577	4,377,601	4,377,259	4,377,182
	4,377,151		4,377,857	16 :	4,377,015	21 : 4,377,470	4,377,270	4,377,196
	4,377,154		4,377,860	17 :	Re.31,183	22 : 4,377,009	4,377,298	4,377,209
	4,377,165		4,377,862		Re.31,187	4,377,686	4,377,301	4,377,231
	4,377,179	08 :	4,377,074		4,377,024	23 : 4,377,548	4,377,368	4,377,248
	4,377,194		4,377,088		4,377,059	24 : 4,377,034	4,377,376	4,377,256
	4,377,228		4,377,330		4,377,097	4,377,077	4,377,377	4,377,257
	4,377,254		4,377,338		4,377,111	4,377,385	4,377,539	4,377,285
	4,377,260		4,377,465		4,377,118	4,377,414	4,377,542	4,377,315
	4,377,287		4,377,508		4,377,128	4,377,434	4,377,551	4,377,383
	4,377,306		4,377,640		4,377,187	4,377,553	4,377,586	4,377,412
	4,377,307		4,377,803		4,377,195	4,377,554	4,377,608	4,377,436
	4,377,318		4,377,842		4,377,200	4,377,645	4,377,675	4,377,437
	4,377,339		4,377,845		4,377,211	4,377,793	4,377,676	4,377,445
	4,377,343	09 :	4,377,102		4,377,240	4,377,811	4,377,712	4,377,447
	4,377,361		4,377,134		4,377,251	25 : 4,377,012	4,377,713	4,377,448
	4,377,372		4,377,168		4,377,252	4,377,033	4,377,724	4,377,449
	4,377,380		4,377,214		4,377,290	4,377,075	4,377,738	4,377,450
	4,377,382		4,377,264		4,377,292	4,377,091	4,377,851	4,377,469
	4,377,384		4,377,337		4,377,331	4,377,109	27 : 4,377,017	4,377,493
	4,377,403		4,377,355		4,377,358	4,377,190	4,377,130	4,377,495
	4,377,419		4,377,420		4,377,359	4,377,261	4,377,159	4,377,497
	4,377,441		4,377,428		4,377,416	4,377,291	4,377,170	4,377,501
	4,377,466		4,377,461		4,377,502	4,377,340	4,377,246	4,377,503
	4,377,482		4,377,510		4,377,516	4,377,356	4,377,324	4,377,519
	4,377,489		4,377,521		4,377,606	4,377,389	4,377,346	4,377,523
	4,377,492		4,377,530		4,377,638	4,377,481	4,377,363	4,377,531
	4,377,506		4,377,581		4,377,725	4,377,485	4,377,547	4,377,570
	4,377,509		4,377,590		4,377,728	4,377,540	4,377,579	4,377,584
	4,377,560		4,377,598		4,377,729	4,377,595	29 : 4,377,054	4,377,589
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DESIGN PATENTS

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268,300
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268,331
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09 : 268,319
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44 : 268,315
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55 : 268,321

PLANT PATENTS

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5,001
5,002
5,010
39 : 5,004
41 : 5,003
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